Collected Papers
IN HONOR OF

Erik Kellerman Reed

David A. Breternitz         William A. Lucius
David M. Brugge             Stewart Peckham
Charles C. DiPeso           Carroll L. Riley
Bertha P. Dutton            Albert H. Schroeder
Robert C. Euler             Douglas W. Schwartz
William B. Gillespie        Charlie R. Steen
W. James Judge              H. Wolcott Toll
Marjorie F. Lambert         A. Helene Warren
Stephen H. Lekson           Arnold M. Withers

Edited by Albert H. Schroeder

Papers of the Archaeological Society of New Mexico: 6
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Albert H. Schroeder
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NEWSLETTER

Distributed to members only
It is the Society's pleasure to honor Erik Kellerman Reed, widely known for his many publications relating to Southwestern archaeology, physical anthropology, and history. His contributions include a variety of syntheses and new concepts that have had a major impact on the Southwestern field.

In addition to his long term position as Regional Archaeologist for the Southwest Region of the National Park Service, he has been an active member of a number of societies, serving also on the Board of Trustees of the Archaeological Society of New Mexico. We are proud to present this volume in which his colleagues do him honor.

The Society owes its thanks to the Albuquerque Archaeological Society Press in the production of this volume, especially to Richard A. Bice who bore the brunt of the work. We are also grateful to Phyllis Hughes for the cover design and to Nancy Fox for her assistance in proofreading.

Albert H. Schroeder

August 1980
Erik Kellerman Reed

Photograph by Fred Mang
National Park Service
Santa Fe, New Mexico
THE LIFE AND TIMES OF ERIK KELLERMAN REED

CHARLIE R. STEEN

In the summer of 1914 a lady left her home in Washington, D.C. and went to Quincy, Massachusetts, where on August 16 she produced a male child. He was promptly named Erik Kellerman Reed. The Reeds returned to Washington and, as boys do, young Erik grew towards maturity.

He graduated from Washington Central High School and then entered George Washington University for his freshman year. Following that he spent three years at a ranch school at Deep Springs, California. This is the single period of Erik's life that seems not to fit its general pattern. It is difficult to picture him togged out in chaps and big hat ki-yi-ing across a pasture to herd recalcitrant cows into a corral.

After the California years, he returned to G.W.U. and received a B.A. degree in the spring of 1932, with a major in anthropology. His principal professor was one of America's pioneer anthropologists, Truman Michelson.

Erik then went for graduate studies to that well-known institution on the banks of the Charles--Harvard. There his professors were Alfred M. Tozzer, Roland B. Dixon, and Earnest A. Hooton. He was fortunate in both undergraduate and graduate schools to have guidance from some of the early serious students of American anthropology, in addition to teachers who helped guide early movements of what we like to consider as "modern" anthropology.

To continue with Erik's academic career--he received an M.A. from Harvard in 1933 and passed the preliminary examinations for a Ph.D. in 1934. For the summer of 1933 he was granted a Laboratory of Anthropology Fellowship and spent the season working with Frank H. H. Roberts, Jr. (of the Bureau of American Ethnology) at the Allantown Site, Arizona. His formal studies at Harvard were completed in the spring of 1934, and he spent that summer working under Emil W. Haury (then of Gila Pueblo, Globe, Arizona) at the Harris Site in the Mimbres area.
This was the period of the great (Great?) Depression. How close one was to this period determines the capital letters which are applied to the term. This was the period of "relief" organizations which were established to give citizens a chance to make a living wage and keep them off the bread lines. CWA, PWA, and WPA became household words, and a number of archaeological projects were carried on throughout the country under the aegis of these initials because someone in the Federal government thought that archaeology was an occupation which could be carried on by a lot of men with a minimum of supervision and equipment.

Erik was drawn into this current and became a supervisor of a CWA (Civil Works Administration) project to excavate some shell middens under supervision of George Woodbury at a place called Cape Canaveral, Florida. Unfortunately his labors did not make this sandy spit famous; it took a different and more involved technology some 30 years later to make this cape a name well known to the world.

One amusing story came from this job. Frequent visits from the local populace, who did not quite understand what was being done, resulted in hard to answer questions. One day our hero Reed, presumably working away with a trowel and with his head down, heard the question "Why are you digging here?" His quick answer was "For $45 a week," and he was somewhat surprised at the rejoinder, "I'm sure you don't have so sordid a viewpoint as that."

During the winter of 1934-35, he worked under Emil Haury on the great Snaketown excavation. After that came a succession of short jobs—appointment by the National Park Service as Seasonal Ranger at Hovenweep, Arches, and Yucca House National Monuments in the summer of 1935. Then in August 1935, there was a job with the State Parks Division of the Civilian Conservation Corps in which he supervised several archaeological projects, including the excavation of the Spanish Colonial Mission at Goliad, and during the summers of 1936 and 1937 made an archaeological survey of the area which was to become Big Bend National Park.

In March 1937, he was assigned administrative duties (for archaeology) at the National Park Service office at Santa Fe, New Mexico. This office
became the Regional Office for NPS activities in the Southwest, and in 1939 Erik was appointed Regional Archaeologist.

He carried on a major excavation at sites in Mancos Canyon, Colorado, in 1942. This was done for the Bureau of Indian Affairs and the Ute Mountain Indian Agency because of impending road construction. It was probably the first highway archaeological salvage project in this country.

In August 1943, Reed volunteered for army service, was assigned to Military Intelligence Service, and served in the European Theatre of Operations until March 1946. While he was in the army, Harvard accepted his report on the Mancos Canyon excavations as a dissertation and Reed was granted the Ph.D. degree. He returned to the National Park Service where he worked as Regional Archaeologist and Regional Chief of Interpretation until his retirement in 1969.

This period was not spent entirely behind a desk in Santa Fe. Assignments he carried on included:

- Winter, 1952 -- Assignment in Guam for the Division of Territories, Department of the Interior, for a survey of archaeological and historic sites in the Marianas Islands.
- Winter, 1953 -- Member, Norwegian Archaeological Expedition to the Galapagos Islands.
- Fall, 1958 -- UNESCO Mission to Peru to study methods of preservation of adobe ruins on the coastal plains.
- Winter, 1960 -- UNESCO Mission to Peru to advise on stabilization methods in the highlands.
- Spring, 1966, 1967 -- Furlough to teach at the University of Utah.
- Spring, 1968 -- Taught at University of New Mexico

Three autumn semesters (1968, 1970, and 1971) he taught at Southern Methodist University.

He married Dorothy Fisher of Hannibal, Missouri in the winter of 1938, and they collaborated in the production of a daughter, Patience Reed Buckle, and a son, Timothy P. Reed. Erik and Dorothy were divorced in 1970 and he
subsequently married Evelyn Dahl.

So much for the dry bones of his professional and social life.

Erik was fortunate in that his career extended from the period dominated by men such as Michelson and Dixon to that in which Roberts, Hooton, and Haury were leaders. He benefitted from the teaching of all of these men and, by his own personality, became a strong force in recent developments in Southwestern archaeology. For a number of years he was considered to be a Young Turk, bent on upsetting established theories and concepts. His writings, however, are frequently efforts to explain earlier theories in the light of later discoveries.

His is a lively mind and a strong personality. He is a raconteur of the first water with a fine flair for the shaggy dog story. In the days when we were colleagues in the National Park Service, he shortened many stretches of roadway with long involved stories which he would culminate with an outrageous pun and a great burst of laughter.

This biographical sketch of Erik Reed can well be ended by one of his own (shorter) stories, a yarn which he relates from his days of digging at Goliad State Park, Texas. The workers were World War I veterans who were enrolled in a Civilian Conservation Corps camp. One day a piece of twisted metal was found and Erik was asked to identify it—and couldn't. One of the workers then announced that "'Pears to me an archaeologist is a fellow who doesn't know what he's lookin' for, doesn't know where to look for it, and doesn't know what it is when he finds it."

After his retirement from the National Park Service, Erik was the recipient of the Department of the Interior Distinguished Service Award.

Santa Fe, New Mexico
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Some of you have shared the view from my front porch, and only you can know what I am really talking about. But for those who have neglected this pleasure, I may say that my front porch near Rye, Colorado, commands a view from the Rocky Mountains eastward for as far as your mind wishes to travel. From my porch I can see Gov. Valverde chasing Comanches in 1719. I can see Ulibarri in 1706 traveling through Apache country.

But one thing I can see without binoculars or imagination is a pine-enclosed clearing on Graneros Creek containing a settlement of the Woodland Indians. They lived here prior to A.D. 500. In searching for related sites, I have come to realize that this site sits close to the southwestern corner of that part of North America occupied by these people during the first millennium of the Christian Era.

I understand that the Woodland tradition may be discussed and defined on different levels of cultural attainment. Gordon Willey (1966, p. 267) mentions the minimal definition as the presence of Woodland pottery, as proposed by W. H. Sears (1948). In the Plains we so often lack the burial mounds and other elaborations of religious paraphernalia. So, I am inclined to go along with Sears' definition if horticulture may be added to the conversion of clay into waterproof containers.

Now, from my front porch a couple of years ago I began to see a line running generally east and west beyond which these Woodland people rarely penetrated. The western-most point on this line I would anchor on top of Wolf Creek Pass in the San Juan Mountains, to select a location recognizable in modern geography. To the west of Wolf Creek Pass lies the upper valley and tributary creeks of the San Juan River where a good many Basketmaker III remains have been recognized. To the east this line runs across the San Luis Valley to La Veta Pass in the Sangre de Cristo Mountains. This high valley, forming the headwaters of the Rio Grande, has presented seasonal attractions.

since Folsom times, but these remained largely seasonal until the coming of
cattle, sheep, and potatoes. We have recorded a couple of Woodland sites
here—or perhaps more accurately, Woodland sherds.

East of La Veta Pass this line follows the Cucharas River for a short
distance toward Walsenberg and then begins to bend gently toward the south
and the drainage of the Canadian River. This river, as it crosses north­
eastern New Mexico and the Texas Panhandle, marks the southernmost extension
of Woodland pottery in the Plains.

Following the Canadian River to its confluence with the Arkansas
River, we can find Woodland-like pottery in Oklahoma at the Mouse Site and
the Phillips site on the Washita River (Buck, 1959). These sites have been
assigned to the Custer Focus. Farther east on the Canadian are localities
like the Ross Site (Hofman, 1971) and the Duncan-Wilson Rockshelter (Lawton,
1968) in Caddo County, Oklahoma, with good Woodland pottery.

Then this southern Woodland Boundary skips across into northwestern
Arkansas and the White River drainage. Along the White River, Williams has
described a sand-tempered pottery he calls Barnes Cord Marked (Phillips,
1970, pt. 1, p. 43) which seems to be a variety of the Woodland pottery we
are talking about. It has been assigned to the Dunklin Phase of the Baytown
Period (Ibid., pt. 2, p. 903). Recognizing this as a related ceramic
variety in southeastern Missouri and northeastern Arkansas would place it
here in the Mississippi Valley within the time range of the Woodland pottery
in eastern Colorado.

I will not attempt to continue this southern Woodland boundary through
the morass of ceramic remains east of the Mississippi River. Mulberry Creek
Cord Marked of the Deasonville Phase (Ibid., p. 907) may be pertinent to this
story. But the view from my front porch becomes hazy when I try to compare
my simple Woodland sherds from the Craneros Creek with clay-tempered sherds
from the Yazoo Basin and the hill country to the east.

But for those who might wish to extend this southern boundary of
Woodland pottery to the Atlantic coast, I would suggest that they inspect
Wilmington Heavy Cord-marked (Williams, 1977, p. 113). I would further
suggest that the Wilmington Phase in the vicinity of Savannah, Georgia, represents the southeastern corner of this Woodland distribution just as Wolf Creek Pass, or perhaps more properly La Veta Pass, represents the southwestern corner. It is interesting, too, that these complexes have been dated in southern Colorado, in southern Oklahoma, in the Mississippi Valley, and on the Georgia coast in the years between A.D. 300 and 500.

Returning to the southwestern corner of this boundary, we may examine some of the Southwestern materials which have been found close to it. In 1938 and 1940 Morris and Burgh excavated the Talus Village and rock shelters north of Durango, Colorado (Morris and Burgh, 1954). These Basketmaker II houses in many respects resemble one Woodland house at the Belwood Site on Graneros Creek in southwestern Pueblo County, Colorado (Hunt, 1974), designated as the type site of the Graneros Focus (Withers, 1954). In both localities, the houses were circular with shallow, saucer-like floors. The hearths were shallow basins in the earth near the center and bell-shaped pits or cists were dug below the floors. The Talus Village houses had walls of wood and mud masonry; the walls of the Belwood Site house may very well have been similarly constructed. The lithic materials from both sites were very much alike. One difference was the occurrence of Woodland pottery at the Belwood Site. No pottery was found at Talus Village. The latest occupation at Talus Village has been dated to about A.D. 330. The house at the Belwood Site has yielded a radiocarbon date of A.D. 450 (Breternitz, 1969).

Moving eastward, we find the sites of the Los Pinos Phase which date from about the same time and are located along the Pine River just north of the San Juan River in northwestern New Mexico. The houses are circular with basin-shaped hearths and bell-shaped pits, but differ in having cobble pavements around them. The associated pottery seems to be Southwestern brown-ware, and not Woodland (Eddy, 1961).

A few miles farther east, Hibben (1949) has reported Woodland pottery associated with the Gallina Complex in northern New Mexico. His photograph of cord-marked sherds makes them appear to be more likely affiliated with
the later Apishapa Focus (Withers, 1954), which would be more in line with the 13th century dating of the Gallina materials. Recent work in the area during the 1977 and 1978 seasons (Ellis, 1978) has produced no cord-marked pottery. However, the conical bottoms of the Gallina utility vessels may reflect a holdover from some earlier, but as yet undefined, contact with the nearby Woodland people. Judd (1954, p. 195) has reported similar jars from Pueblo Bonito.

East of the Sangre de Cristo Mountains and south of the Huerfano River very few materials that can be interpreted as Woodland have been brought to light by the work at Trinidad Junior College or by surveys of the University of Denver and the University of Colorado. But here in southeastern Colorado, this Woodland boundary bends to the south to the Canadian River in the Texas Panhandle. Here good Woodland pottery occurs.

And here in the Texas Panhandle, I think that we can see the confluence of this line we have been following with another boundary. Di Peso (1974, vol. 1, p. 48) defines the Gran Chichimeca as the northern frontier of Mesoamerica, placing the northeast corner at the junction of the 38th degree of north latitude (Jennings, et al. in Wauchope, 1956, p. 63) and the 97th degree of west longitude. This would locate this point some twenty-seven miles northeast of Wichita, Kansas. This placement need not be honed down very much with our present archaeological knowledge to locate this northeast corner of the Gran Chichimeca in the Texas Panhandle along the Canadian River.

Abutting this line of Woodland materials, there have been found Mogollon sites containing Jornada Brownware. This pottery, like the related Alma Plainware, apparently had a very long life. Dates from the Deadman's Shelter site would place the Mogollon people here in the Panhandle between A.D. 120 and 710 (Hughes and Willey, 1978, p. 189) when they must have had some contacts with their Woodland neighbors.

From here this eastern boundary of the Southwestern archaeological area, following the Mogollon-like pottery, continues south along the western portion of the Llano Estacado to the Davis Mountains and on to the Rio Grande.
East of this line, pottery regarded as Caddoan has been reported (Ibid., p. 30).

In this view we may recognize that for perhaps the first seven or so centuries of the Christian Era there was a Woodland extension south to the line approximately as outlined here from the Rocky Mountains in southern Colorado to the Atlantic coast in Georgia. South of this were the Gulf cultures of the Southeast and the Mexican derived cultures of the Southwest separated by the generally archaic cultures which persisted in Texas.

The Amerind Foundation, Inc.
Dragoon, Arizona

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Williams, Stephen (ed.)

Willey, Gordon

Withers, Arnold M.
THE RIO GRANDE AS SEEN FROM CASAS GRANDES*

CHARLES C. DI PESO

In this day and age the Rio Grande is considered to be the second most irrigated river on earth, as only the Ganges has greater utilization. Furthermore, it is the second largest system in the United States, ranking next to the Mississippi-Missouri drainage. In the arid Southwest it is three times the size of the Gila and one-third again as large as the Colorado. Yet its potential riverine benefits were never fully developed by its indigenous native American residents.

As one gazes northeastward to this fine desert land valley from the Casas Grandes archaeological province, one must visualize its six-fold environmental divisions. Far to the north, in southwestern Colorado, is its high country source, which makes up a mere 2% of its total length and along which there is no irrigable farmland. Ten percent of the drainage forms its upland valley which commences at the junction of the South Fork and runs southward to the Rio Grande gorge, watering the expansive San Luis Valley, 30.6% of its irrigable land. Below the gorge lies the famed upper valley which extends southward to the Salado and involves 11% of the valley's total length and a paltry 6% of its irrigable farmland. Nonetheless, this is the homeland of the Eastern Pueblo folk and is often referred to as the "Northern" Rio Grande. Below the Rio Salado junction, as far south and east as the St. Elena Gorge, lies the middle valley, known as the Jornada country. This portion involves some 25% of its total length, wherein there is contained 10.8% of its tillable valley land. Southeastward from the St. Elena Gorge, through the Big Bend country and to the Rio San Juan, lies the lower valley. In this sector the river expands 37% of its length and waters an insignificant 3.8% of its agro-lands before it finally comes to the fan-shaped delta, wherein the river meanders through the remaining 14%

*Presented at the 1977 Pecos Conference Symposium.
of its length and 48.8% of its irrigable lands. These, then, are the major subdivisions of this great arid lands river, which involves some one million hectares of potentially tillable land along its three thousand kilometer length. Yet throughout their history, the native American farmers are believed to have utilized only 11% of its length and a mere 6% of its bottomland—or, if one is generous enough to include the Jornada middle valley bottomlands, 36% of its length and 17% of its productive lands. Does it not seem strange that the soil exploiters of this arid portion of the northern frontier were so hesitant in harnessing this, the largest river in their domain, to their particular farming subsistence needs? It is not known whether or not this unusual prehistoric phenomenon was due to a certain lack of sophisticated irrigation technology, such as was known in Casas Grandes and southward in Mesoamerica, or perhaps to a combination of factors, such as a peculiar indigenous cultural balance. At this stage of our knowledge we can only ask what combination of social and technological factors kept this system from becoming a verdant Nile in this dry land.

As a scientist, I am moved to view the Rio Grande as a single geographic unit having a related and exciting historical theme—an integrated personality as noted by such interested parties as the photographer Gilpin and the writer Horgan. To date, we as archaeologists and historians have failed to use this gestalt approach, much preferring to concentrate on its various parts. This has resulted in the production of a series of valuable but short-sighted histories, most of which are overshadowed by the upper valley's eastern Anasazi segment.

Perhaps it is both difficult and foolhardy for a Casas Grandian to provoke such an overall perspective, but then again it might prove to have some merit. Such a compendium would necessarily begin with a study of that trickle of water located in the northern heartland of the spectacular San Juan Mountains somewhere near Stony Pass, where the river takes its source. This should include that portion of the valley where the river commences to cascade down its east slope from its snowy birthplace, passing
Goose Creek, from whence it bubbles eastward to meet the South Fork. This portion of the drainage takes life from the high, cold, mountain country—much of which is above the upper limits of agriculture and within the Hudsonian and Canadian life zones. This birthing place apparently served such men as the paleo-hunters, the prehistoric mountain Chichimeca, and the modern Utes alike as a long-termed seasonal gleaning area. Cold and beautiful, man humbly bowed before its majesty as a simple soil member for thousands of years or until the coming of modern mining, lumbering, and herding techniques that have helped to change the face of this beautiful land.

Then the river gathers its force and rushes southeastward past the South Fork and down into the San Luis Valley, past Conejos Creek and to the Rio Grande gorge. In this segment, its waters succor some 300,000 hectares of farmland. Yet the pre-Hispanic indigenes chose not to utilize this upland valley farmland, remaining content to let it serve as one vast gleaning district. Renaud and others believe that throughout man's prehistory the old inhabitants of this area utilized the land as have the historic Utes, Comanches, Apaches, and Navajos—primarily as a source of protein in the gathering of deer, antelope, and bison. Yet today's farmers prosper in the growing of potatoes and alfalfa and in the practice of bee culture. There is a question—why did this fertile land, which contained one-third of the system's productive soil, fail to attract the early native American farmer? Was it climatically too marginal for his skills? Did he lack the proper domesticated seeds, such as the potato? Did he not have a need of it to feed his populations? Or did certain social conditions prevent the soil parasites and exploiters from moving into the area? It seemingly was not an unfavorable area to human occupation in prehistoric times, as Hall believed that this upland valley may well have been the hearth of the Rosa Phase folk who settled in the Governador District. But beyond this there seems to have been no expanded development of human culture in this naturally productive portion of the Rio Grande system.

Below the deeply cut gorge of the Rio Grande the river wends its way through the upper valley, which falls mainly within the Upper Sonoran life
zone. This portion, the homeland of the eastern Anasazi, involves some 358 km. of the river system from that point where it first serves the Tiwa, and then the other Puebloans. It snakes its way southward to the Salado River and then enters the land of the Jornada folk. This upper valley includes 61,000 hectares of productive land but this represents only 6% of the river's total bottomland. Anasazi development in this portion of the valley, as outlined in Lang's introductory paper, indicates the intriguing and complicated folk history of its inhabitants.

This sequence has been variously presented in either an endemic evolutionary framework or in a mild diffusionist atmosphere, beginning with the widespread Llano/Folsom paleo-hunter horizon *circa* 9,500 B.C. and developing into the Cody Complex sometime around 6,500 B.C. A thousand years later this folk culture developed into the Oshara Tradition. Lang proposes that this complex came into contact with the Mexican-based Cochise desert dwellers, perhaps between 1,500 and 1,000 B.C., when the former took on certain aspects of an upper Rio Grande Valley soil parasite society by accepting maize. But actually, it was not until the birth of Christ that these Oshara folk, then in their Basketmaker II Archaic horizon, began to develop productive farming techniques and to adopt new designs in food production tools as well as new food storage methods. Four hundred years later these indigenes, then in their Basketmaker III period, began to make a gray ware pottery known as Lino; to produce open-ended trough metates; to use the bow and arrow; to live in recognizable pit houses having an east-west ventilator-entry orientation which they built around or near proto-kivas; and to store their food in bell-shaped pits scattered randomly about their village sites. In this same time block, the native recipients accepted a high-yield corn seed from their Mexican donors and took on a more aggressive attitude toward their environment, which they exploited for various new raw materials. Seemingly, all of this occurred during a time when these upper valley folk were in communication with the Jornada folk of the middle valley, as well as the Mogollon of the Mimbres district. Both of the latter, as seen from Casas Grandes, were Mogollon-
Chichimecan neighbors with whom there was considerable indigenous connection prior to A.D. 1050. It was a time when the upper valley folk took on a number of socio-religious concepts common to all three southern districts. It was also in this meaningful Pueblo I time block that a red-slipped pottery and the production of corrugated neck-banding became popular in the upper valley. These may have been inspired by the more southerly Chichimecan groups that occupied the Casas Grandes, Mimbres, San Simon, and the middle Rio Grande valleys during the Convento Phase of the Casas Grandes Viejo Period sequence. All lived in some sort of circular pit house generally built about a rather large, round community house. In such indigenous villages the deceased were inhumated in flexed positions, often with funerary furniture. The interchange of trade potteries in all of these frontier areas suggest considerable contact between the above-mentioned groups.

Still, it was not until the Pueblo II period, which is temporally equivalent to the Casas Grandes Pilon and Perros Bravos Phases, that such trade potteries as Mimbres, Reserve, Kiatuthlanna, and Snowflake Black-on-whites became a medium of ceramic trade in both areas, along with turquoise, marine shell, and perhaps copper. After A.D. 950, the Casas Grandians began to live in contiguous surface jacal houses built around compounds, wherein they stored food in pits and interred their dead. These Casas Grandians continued to use circular community houses which they now incorporated into their compound configuration. They also continued to produce their local textured vessels and to stay well within the so-called Mogollon tradition of ceramic production and to trade potteries with the neighboring Chichimecan folk living in the San Pedro, San Simon, Mimbres, and middle Rio Grande valleys.

During the mid-portion of the 11th century, at a time when the Pueblo III folk were enjoying the pleasures of their upper valley, the Casas Grandes indigenous Mogollon-Chichimecans were submerged by the Mesoamerican economic world system. The simple jacal villages of the indigenes were replaced with stout puddled adobe compounds built in several levels. Some of these contained rectangular subterranean ceremonial rooms. There was a city
water or acequia system established, as well as ball courts, pyramidal and road communication systems, and a host of Mesoamerican traits such as sophisticated area water control and irrigation systems, a walk-in-well, and the complicated iconography of the Quetzalcoatl cult, with its appended Xipe, Ehécatl, and Tlaloc complexes. There were drastic additions made in the ceramists' inventories. The local preference for texturing continued its popularity, but in addition the well known Casas Grandes and Gila Polychrome traditions came into being, as did the production of polished Ramos Black, Playas Red Incised Variant, Madera Black-on-red, and the use of glaze paints as a decorative element.

A century and a half later, circa A.D. 1200, the capital city of Casas Grandes underwent a drastic urban renewal and a large multi-storied U-shaped construction covering over one hundred hectares was built with all of the tell-tale architeconic devices of the earlier Buena Fe Phase, when T-shaped doorways, staircases, ramps, colonnades with large rectangular columns, circular stone seating discs, marketplaces, effigy mounds, ball courts, subterranean water drains, to mention only a few items, came to mark the Casas building tradition. There is also strong evidence of high craft specialization in the production of marine shell, stone, and copper, and in the raising of macaws and turkeys. The trade ceramic pattern shifted from the Mimbres Black-on-whites to the White Mountain red wares, Chupadero Black-on-white, El Paso Polychrome, and a few upper Rio Grande Valley types such as Galisteo Black-on-white. All of this occurred in the Casas area about the time that the upper valley folk were experimenting in the use of carbon paints. It is assumed that this sector of the Rio Grande Valley was developing independently of the Casas Grandes Mesoamerican import by Western Pueblos, migrants from the San Juan, as strong cultural ties have been noted archaeologically. And yet there are certain cultural anomalies among these eastern Anasazi, such as the use of coursed adobe masonry after A.D. 1200, the use of circular adobe-lined fire hearths, and the exchange of St. Johns Polychrome, Chupadero Black-on-white, full-grooved axeheads, above-ground ceremonial structures, and incised and glazed pottery, which
give cause to question this simplistic migration theory from the west, as all of these non-Western Pueblo traits are manifest in the Casas Grandes archaeological zone after A.D. 1060. Of particular interest is the belief that the red-slipped Rio Grande glaze wares may have been inspired by the Western Pueblo White Mountain glaze wares; yet, glaze paint was used on Ramos, Carretas, and Huergos Polychromes of the Casas Grandes series and it was introduced shortly after A.D. 1060. It is not outside the realm of possibility that the Eastern Puebloans may have received some of their inspiration directly from the Casas sector. In this regard, the recent reappraisal of Anasazi chronology as made by the Kelleys in terms of a Mesoamerican World System Model should be mentioned. As should the recent findings at Feather Cave and Dr. Florence Ellis's exciting reconstruction of an Eastern Pueblo chronology as based upon the sequential flow of Mesoamerican religious cults into this portion of the Rio Grande Valley. In this, she also commented on the possibility that Potsuwi'i Incised may have been an Eastern Pueblo copy of the Casas Grandes Playas Red Incised Variant. In like vein, work at Pottery Mound has revealed data suggesting Eastern Pueblo and Casas ties in the form of a flat-topped pyramid, mural depictions of horned and plumed serpents, the *Ara maceo* and *Ara militaris* Ramos Polychrome, marine shell ornaments, and other related traits. Perhaps it is time that we reassess the interplay of the eastern Anasazi historical continuum as it occurred in the upper valley with that of the Jornada culture of the middle valley and the Casas Grandes archaeological zone.

The middle valley, the homeland of the Jornada folk, is watered by some 800 km. of the river's length, which constitutes a quarter of the entire lineal system. This segment touches upon 111,000 hectares of farm-land and represents 11% of the productive valley lands, which lie for the most part in the Lower Sonoran life zone. A historical chronology of this desert land has been devised for its prehistoric Jornada occupants, wherein it is proposed that these indigenes were directly related to the Forestdale and Mimbres Mogollon. This historical reconstruction was proposed a
quarter of a century before the Viejo Period of Casas Grandes and Loma San Gabriel culture came to be known. These new cultural sequences now extend the Mogollon-Chichimecan cultures southward through most of Chihuahua and Durango, Mexico, and place a strong "Puebloid" list of traits in the Casas area circa A.D. 950 and certainly after A.D. 1060. Traits such as adobe-walled surface structures, subfloor burials, red-on-brown pottery, marine shell ornaments, stone animal effigy forms, arrowshaft straighteners, three-quarter-grooved axeheads, human foot effigies, tubular pipes, and stone balls, which mark the Mesilla/Capitan and Dona Ana/Three Rivers Phases, were all present at Casas by A.D. 1060, where they were not thought to have been a result of colonial Mimbres influence. Perhaps it would be wise to heed Peckham's suggestion of a southern, rather than a Mimbres, origin for these middle valley folk, as stated in his important Taylor Draw study.

The Jornada culture has been traced from the Rio Salado to the St. Elena Gorge, and the Shiner Site, which contained evidence of the La Junta Focus of the Rio Bravo Aspect. In this same area, at loci such as Van Horn and the Davis Mountain, the red-on-brown pottery found in situ is indistinguishable from the Casas Grandes Viejo Period Mata Red-on-brown Textured and very unlike the Mogollon Red-on-brown from the Mimbres district. These clues suggest the possibility that the middle valley culture was strongly flavored by Casas Grandian culture contacts. If this is ever verified, it will have serious implications in matters appertaining to the historical continuum of the upper valley, as noted by Newcomb in his review of Jumano history. If one can justify his "Puebloid" traits as coming from the Casas area, then the Jumano puzzle takes on new dimensions, as does the archaeology of the Gran Quivira. In this, one must follow leads given by Mera, Daifuku, and Vivian, as there appears to be a strong tie between the prehistoric Jornada folk and the historic Uto-Aztecan-speaking Jumano, and if so, it will have serious repercussions in terms of the total human history of the Rio Grande system.
To continue the way of the river, it continues to wind its way for another 1,150 km. through the Big Bend country, where it forms the arid lower valley as far as the Rio San Juan, wherein there is only 39,000 hectares of Lower Sonoran life zone farmland, a paltry 4% of the total agro-lands. This arid sector was never favored by native American farmers, as it was homeland for thousands of years to the Coahuiltecan-Chichimecan whose life-way has best been described by Taylor through his descriptions of Frightful and Fat Burro caves, as well as MacNeish's northern Tamaulipas studies. The Desert Culture borne by these people remained static for centuries and formed what is known as the Coahuila Complex, which was not confined to the lower river valley but spread as a gleaning culture far north and south of the river.

And finally there remains the sub-tropical delta, which lies below the Rio San Juan, where the river meanders some 445 km. and waters 499,000 hectares of irrigable land. Almost half of the worthwhile farmland of the entire system lies in this lowest sector. But like the source, the upland, and lower valley, it was never utilized in agro-production by the pre-Hispanic native American. Like the lower Coahuiltecan Valley, it was utilized by nomads bearing the Berril and Brownsville Cultural Foci who enjoyed seafood. In this area and on some of the dune sites, a few Huastec sherds have been encountered, which suggest contact with these sophisticated southern farmers. Their presence in the delta led Krieger to propose the presence of the now outmoded concept of the Gillmore Corridor. Whatever contact these nomads had with their Mesoamerican neighbors, it apparently did little to change their life-style.

In summary, it would appear that as archaeologists we must look at the potential offered by the Rio Grande system and ask why the native American farmers made use of less than half of its agro-potential and then at a comparatively late date. We must review the Jornada or middle valley cultures in terms of possible relationships with Casas Grandes, as well as with the Mimbres-Mogollon, and when this is done we must study the possible Jornada influences on the eastern Anasazi of the upper valley.
Until we conceive of the Rio Grande system in its totality and its relationships with the Casas Grandes archaeological zone, we have little hope of successfully recreating the history of its native American residents.

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Dragoon, Arizona

2. Rand McNally (1965, p. 197) lists the Mississippi-Missouri system as measuring 6,433 km. (3,860 mi.) in length, the Rio Grande as 3,133 km. (1,885 mi.), the Gila as 1,050 km. (650 mi.), and the Colorado as 2,335 km. (1,450 mi.).

3. | RIVER SECTOR | LINEAL DISTANCES | AVAILABLE FARMLAND |
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<tr>
<td></td>
<td>Km.</td>
<td>Mi.</td>
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<tr>
<td>High Country, Stony Pass to South Fork</td>
<td>67</td>
<td>40</td>
</tr>
<tr>
<td>Upland Valley, South Fork to Rio Grande Gorge</td>
<td>325</td>
<td>195</td>
</tr>
<tr>
<td>Upper Valley, Rio Grande Gorge to Rio Salado</td>
<td>358</td>
<td>215</td>
</tr>
<tr>
<td>Middle Valley, Rio Salado to St. Elena Gorge</td>
<td>787</td>
<td>472</td>
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<tr>
<td>Lower Valley, St. Elena Gorge to Rio San Juan</td>
<td>1,151</td>
<td>691</td>
</tr>
<tr>
<td>Delta, Rio San Juan to Gulf of Mexico</td>
<td>445</td>
<td>267</td>
</tr>
<tr>
<td>Totals</td>
<td>3,133</td>
<td>1,880</td>
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6. Renaud (1942; 1946) noted the presence of some forty sites, none of which was agricultural. Similarly, Wormington and Lister (1956, p. 89) recorded the presence of non-farming sites and only a rare scattering of late Anasazi trade sherds.


9. Irwin-Williams, 1973, p. 4 and fig. 7.

10. Ibid., pp. 4-16.


12. Ibid., pp. 2-3.

13. Wendorf and Reed (1955, p. 143) outlined the Developmental Pueblo Period (A.D. 600-1200) in the Rio Grande, as compared to that in the San Juan, and discussed the presence of incised pottery in this period. In the Coalition Period (A.D. 1200-1325) they spoke of the problem of these non-Western parallels (Ibid., pp. 143-148).


15. Wendorf and Reed (1955, pp. 149-151) discussed the Classic Period (A.D. 1325-1600) in terms of the red-slipped glaze ware development, which they thought to be inspired by the Western Pueblo glaze ware series.

16. Di Peso, Rinaldo, and Fenner, 1974, Vol. 6, p. 93; also note Carlson (1970, pp. 112-113), who believed that there may have been a correlation between the yellow wares from Casas Grandes and the Western Pueblo glaze series.


19. Ellis (1976) has done an excellent job of presenting the temporal aspects of the iconography of the Tezcatlipoca, Quetzalcoatl, and...
Huitzilopochtli cults in the upper valley. Also see Ibid., p. 92.

20. Ibid., p. 100; also see Fox, 1975, p. 89.


23. Ibid., pp. 89-90. Also see Suhm, Krieger, and Jelks, 1954, pp. 36-45.


25. Peckham (1976, p. 56) makes this suggestion for the 10th century Taylor Draw people of Chupadero Mesa. He terms them a Mogollon-Anasazi hybrid culture. Also see Holden (1952, pp. 127-128) for description of the hybrid culture at the Bonnell Site, and Robinson, Hannah, and Harrill (1972, p. 90) for Taylor Draw dendro date.

26. Kelley, Campbell, and Lehmer (1940, pp. 73-81, 160-161) have a description of the Shiner Site (Shafter 6:1). Also see Kelley, 1949, pp. 112-113; 1951, p. 119; Suhm, Krieger, and Jelks, 1954, pp. 45-51; and Lehmer in Campbell, Davis, and Jelks, 1960, pp. 116-133.

27. Sherds sent by Dr. Joe Ben Wheat from Van Horn were used in this comparison, as were photos of a vessel from the Davis Mountain (Rustler Hills, Culberson County) sent by D. L. Hamilton.


29. Mera, 1940.


32. Ibid., pp. 10-11 for linguistic detail, and pp. 140-154 for archaeohistoric inferences. Also see Sauer (1934, p. 65) for linguistic detail.

33. Taylor, 1966; also Newcomb, 1961, pp. 29-57.

34. MacNeish, 1958.


37. Krieger, 1948; also see Campbell in Campbell, Davis, and Jelks, 1960, p. 155, and pp. 163-165 for a review of the archaeology of this area.
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HOW FAR CAN A POCHTECA LEAP
WITHOUT LEAVING FOOTPRINTS?

ALBERT H. SCHROEDER

Few today will deny the presence of mesoamerican traits in the prehistoric Southwest. How they are transmitted has been the object of much discussion over several decades. Operational processes considered have ranged from unregulated diffusion (Schroeder, 1966, p. 683) by means of informal, irregular trade contacts to suggested sophisticated controlled mechanisms that transmitted a functionally related complex (regulated diffusion) that introduced new ideas through formalized trade relations (such as a pochteca operation), or by a migration that set up a colony outside of the home area (pattern diffusion). Some also have suggested that trade merchants came out of various centers in Mexico to trade in the Southwest and then returned to their point of origin with the products obtained in exchange.

The trade of articles over great distances is obvious in the Southwest. The Arizona-Pacific Trail from the Los Angeles area to Needles, California (Farmer, 1935, p. 154) was in operation at least by A.D. 900 (Rogers, 1941, p. 5), and probably earlier, judging by the presence of abalone shell in sites as early as Basketmaker II (pre-400) in the Zuni area (Roberts, 1931, p. 160). It still was operating as a shell trail in 1776 (Coues, 1900, p. 237).

The Spaniards in 1540 met Indians on the lower Colorado River below Yuma, Arizona who had been to Zuni, knew about Estevan having been killed by the Zunis the year before, and traded with the Zunis (Hammond and Rey, 1940, pp. 140-143, 145, 148, 151). In 1604-05, Indians north of as well as south of Yuma informed the Spaniards that coral was obtained from the Gulf of California, and these Spaniards, on their return to New Mexico, found similar material among the Zunis (Hammond and Rey, 1953, pp. 1018, 1022). Bandelier reported that Pueblo Indians, as late as 1859, were still making trips to Sonora to trade (Lange and Riley, 1970, p. 237).
Nuno de Guzman, in the late 1520s, was told of Indian commerce via northwest Mexico which traded fine feathers with people in the interior (Hodge, 1937, pp. 3-4). Cabeza de Vaca in the Valley of the Hearts in Sonora in 1536 learned that the Indians here traded parrot feathers to Indians who lived in very large houses far to the north in exchange for turquoise (Bandelier, 1890, p. 42). In 1581, the Rodriguez expedition, while on the Rio Grande below El Paso, was given two bonnets made of macaw feathers. Earlier, farther down river, they had met an Indian with a "copper sleigh bell" which he said had come from the west (Hammond and Rey, 1927, pp. 19, 22). Similar copper bells as well as macaws came from west coast Mexico in prehistoric times over a trail that passed through the Sierra Madre to Casas Grandes in Chihuahua (Di Peso, 1974). This record in 1581 is another example of a prehistoric trade route still in operation in historic times. These same items also occur over a wide area of the prehistoric Southwest (Hargrave, 1970; Sprague and Signoir, 1963).

In 1582, nine days travel north of the Conchos-Rio Grande junction, the Espejo expedition also was given "ornaments like bonnets with colored feathers" which they said they obtained from the direction (west) of the sea (Hammond and Rey, 1929, p. 67). One of the Indians on the lower Colorado River below Yuma brought Alarcon some parrot feathers in 1540 (Hammond and Rey, 1940, p. 151). In 1716, Father Luis Velarde reported that the Pimas of southern Arizona raised many macaws which they stripped for use in adornment (Wyllys, 1931, pp. 129-131). These occurrences indicate that prehistoric practices and sources in northwest Mexico were still in operation in historic times, and covered great distances.

These examples also indicate that in some instances (Pueblos of New Mexico and Yumans on the west) traveled the full length of some of these trails in historic times to barter for certain goods.

In discussions bearing on material culture, similarities between prehistoric mesoamerica and the Southwest most commonly mentioned are items found at Hohokam sites—ball courts, mosaic mirrors, copper bells, macaws, etc. To account for these and other items, Haury (1976, pp. 343-348)
suggests that an intrusive group, the Hohokam, arrived from the south pre-A.D., at the beginning of the Pioneer Period, and settled in southern Arizona. The appearance of a large number of mesoamerican elements in the following Colonial Period (A.D. 600 to 900) he considers to be a reflection of continued, but informal, contact with their southern area of origin. He rejects transmittal by pochtecas, which type of formalized exchange he considers was a derivation from the much later Aztec culture.

Di Peso (1956, pp. 560-564, fig. 40) interprets the early events in southern Arizona as an in-place development of the Ootam who later were submerged in some places (at Snaketown on the Gila River and along other water courses) by the entry of the Hohokam either during the Snaketown Phase or at the beginning of the Colonial Period.

I agree (1940, p. 141; 1960; 1966; 1975, pp. 37, 40, 47) with Di Peso that the Pioneer Period represents a local development influenced by pre-classic Mesoamerican unregulated diffusion out of Mexico, but identify the original inhabitants of the middle Gila-lower Salt region as the Hakataya related to the tradition of central and western Arizona rather than the Ootam of southeastern Arizona. I place the Hohokam intrusion and original settlement in the transition between the Pioneer and Colonial Periods, the late Snaketown Phase, entry being by a west Mexico coast corridor and probably by pochteca colonists of the Mesoamerican Classic Period (Schroeder, 1965, pp. 301-302; 1966, pp. 687, 699; in press).

When one notes the scarcity of Pioneer Period sites reported to date as opposed to the larger number of early Colonial Period sites, the difference is almost phenomenal as are the differences between the culture patterns of the two periods (Schroeder, 1966, p. 686). Moreover, during the transition phase between these two periods there is a duality of associated comparable traits which suggest two patterns or a dual occupation at this point in time. The new pattern, the Hohokam, almost completely submerges that of the Pioneer Period Hakataya by the early Colonial Period (Ibid., pp. 683-686).

By no coincidence, neighboring areas exhibit sites with Gila Butte
Red-on-buff, made during the early Colonial Period, as the earliest pottery associated. Di Peso (1956, p. 562) recorded a Hohokam intrusion into south-eastern Arizona in the early Colonial Period at the latest. On the western margin of the Hohokam area in the Gila Bend region, the earliest Hohokam sites recorded are those of the Gila Butte Phase (Schroeder, 1961, table 1; Wasley and Johnson, 1965, pp. 5, 80). To the north in Hohokam-like sites in the Agua Fria drainage, the same holds true (Weed and Ward, 1970, p. 5) as well as in the middle Verde Valley (Breternitz, 1960, p. 22; Fish and Fish, 1977, p. 12), in the Tonto Basin-Globe-Miami area (Doyle, 1976a, pp. 245-246; 1976b, p. 7), and at Walnut Creek (Morris, 1970, table 1).

All of the sites established outside of the Gila-Salt River core area, according to the above cited reports, were not a continuation out of a Pioneer Period settlement. Only an occasional Snaketown Red-on-buff sherd is present. Thus, these sites were established after the transition period.

Unfortunately, too few Pioneer Period sites are known or have been excavated. However, judging from the site at Snaketown, the village was a small cluster of squarish houses with a larger structure of the same general plan associated, a type of structure that may have continued into later phases (Haury, 1976, fig. 3.28). The latter may have served as a kin lodge for small village or extended family related affairs and/or ceremonies. Early Mogollon villages reflect a similar pattern, including a larger structure (Wheat, 1955, pp. 57-58). Early Anasazi sites, also small, appear to have lacked such a lodge. Some investigators have suggested instead that the earliest Anasazi pit houses for a while served both domiciliary and ceremonial purposes (Roberts, 1939, p. 256).

The houses of the Colonial Period are rectangular in plan, rather than squarish, as a general rule, and several of the sites exhibit canal irrigation and/or a large ball court (Snaketown type), a new feature obviously derived from Mexico. The scattered distribution of these early ball courts among the Hohokam suggests that they represent intercommunity lodges. Each site with such a structure seems to have served as a regional center for a cluster of surrounding sites without a court, each cluster
representing a population unit with a socio-economic-ceremonial center, the site with the ball court (Schroeder, 1966, p. 694). Only a few of these ball courts occur in Hohokam-like sites outside of the core area, where information on a possible surrounding cluster of sites is not presently available due to a lack of survey.

Several post-A.D. 600-900 western Mogollon and some eastern Four Corners Anasazi sites, including the Chaco Canyon locale, seem to have adopted a similar center oriented intercommunity settlement pattern from the Hohokam, scattered around an intercommunity round great kiva (Schroeder, 1963, p. 19, fig. 1; 1966, fig. 2). Though the Kelleys (1975, pp. 192-194) suggest that great kivas may have been derived more directly out of Mexico, the coincidence of Hohokam ball court-Anasazi great kiva development histories is being followed here (Schroeder, 1963; 1966, pp. 690-693).

Other contemporary Anasazi, however, exhibit a different pattern—a small line or arc of storage rooms with a pit house in front (Roberts, 1939, figs. 25, 37; Daifuku, 1961, fig. 10). Larger sites of the late 700s among the western Anasazi, in the Four Corners region, are made up of several similar arcs of contiguous rooms with a kiva (kin lodge?) in front of each arc (Brew, 1946, fig. 13; Martin and Rinaldo, 1939, map 19; Hayes, 1964, pp. 89-91) and appear to be a concentration of several small sites of a once scattered population unit that congregated into one multi-kin village (Schroeder, 1966, pp. 693-694). The eastern Mogollon appear to have retained their small villages with a kin lodge until the 900s, according to present evidence.

Some of the recent literature, when referring to any or all of these larger structures, make use of the term "public architecture," but it will be avoided here since kin, intercommunity, and intracommunity better indicate the nature of the settlement pattern associated with each of these structures. Most investigators agree that these were built by and for the population unit involved, thus representing "public architecture."

In view of the above mentioned differences on either side of the Pioneer-Colonial Period transition in southern Arizona, it is obvious that
a large population increase took place in a short space of time if we are to account for the establishment of so many sites during the Gila Butte Phase, both within and outside of the Hohokam core area. It also is obvious that new socio-economic-ceremonial practices were introduced, judging by the appearance of ball courts and a new settlement pattern that diffused to the western Mogollon and eastern Four Corners Anasazi. To conjecture such a development out of the Pioneer Period culture and its apparently sparse population, including consideration of the newly introduced technologies and customs, seems unlikely (Schroeder, 1966, pp. 686-687).

The non-core area sites of the Colonial Period (with Hohokam attributes), which I call colonies because they were set up among neighboring non-Hohokam groups, differ from those of the core area in several respects. The plainware associated with these colonies is not Gila Plain, but a locally manufactured type in all cases. In the A.D. 600-900 period, at colonies in the Agua Fria drainage, Wingfield Plain is dominant (Weed and Ward, 1970). This type also occurs at non-Hohokam sites and later (post-1125) at pueblos in this drainage (Schroeder, 1954). In the middle Verde Valley, Verde Brown is the common type (Breternitz, 1960), also at other contemporary sites and pueblos dating after 1125 (Schroeder, 1960, 1975). In the upper Santa Cruz area, locally made plainware accounts for all vessels in Hohokam-like context (Di Peso, 1956, p. 324). This pottery also is found with sites of the same area, both contemporaneous and later (Ibid., pp. 299, 303). At Gila Bend, the locally made pottery is referred to as Gila Plain, Gila Bend variety, and also is the common pottery after A.D. 1150 (Wasley and Johnson, 1965, pp. 12, 54).

Additional factors illustrating connections between the above noted colonies and core area sites include associated sherds of red-on-buff which cannot be distinguished from those of the core area, suggesting the import of the decorated ware. The roster of materials associated, as reported in the above noted references, lacks the quantity and variability of "luxury" items found in the core area.

The presence of contemporary non-Hohokam sites in the same area as the colonies with the same plainware, the complete withdrawal of the
Hohokam colonies from all of these areas by the middle 1100s, and the continued manufacture of the same pottery after the Hohokam withdrawal, in pueblos and other sites constructed in a non-Hohokam architectural style, strongly suggest that these plainwares associated with the colonies were not Hohokam.

In short, these colonies, while they represent pattern diffusion of an outward move, resulted in the establishment of specialized sites—"trading posts," resource exploitation or extraction sites, or subcenters—which exhibit a complex of traits related to their function but not the full complement of core area traits and technology. This Gila Butte Phase expansion of colonies is similar to events that occurred earlier in northern Mexico (Weigand, 1968, p. 45; Kelley and Kelley, 1975, pp. 184-185) where the establishment of Classic Period mesoamerican colonies or trade centers were an integral part of the system of commerce. The Hohokam entry and the development of colonies appears to represent a well-planned intrusion of a similar type.

Ferdon (1955) suggested that pochtecas existed in Mexico as early as A.D. 1050 to account for the appearance of mesoamerican-like traits among the Chacoan Anasazi. I, in turn (1956, pp. 307-308) indicated that not only was an earlier date possible for such trade merchants, but that this system might have been operative among the Hohokam in the Sedentary Period (900-1150). The Hohokam then could have been the contact that introduced the A.D. post-1050 elements to Chaco. Current evidence, as outlined above, seems to support an introduction of at least a pochteca-derived system as early as the Gila Butte Phase when one considers the implications of the colonies, large intercommunity ball courts, and the variety of exports and imports during the Colonial and Sedentary Periods. It was this trade merchant factor, I believe, that established the Hohokam as the first major culture with regional (ball court) centers in the Southwest.

During the Sedentary Period, two new elements (among others) relative to these discussions appear among the Hohokam—a new type of ball court (Casa Grande type) and a change in the settlement pattern. This new,
smaller ball court appears in far greater numbers than did the Snaketown type and is present at almost all large Sedentary Period sites. In 1963 (p. 19), I suggested that the new court functioned as an *intracommmunity* structure. An increase in population between A.D. 600 and 900 among some of the scattered villages served by the early large ball court would have provided the support for or bring about the need for such a lodge to serve a growing sub-regional population unit, such as seems to have occurred in the Gila Butte-Santan region (Wilcox, 1979, figs. 26-28). This smaller court did diffuse to the colonies, more so than the earlier court (Schroeder, 1963, fig. 1; Fish and Fish, 1977, p. 13).

Shifts in sizes and orientations of four types of ball courts seem to have been duplicated by four slightly later comparable changes in eastern Four Corners Anasazi great kivas (Schroeder, 1963, p. 19, fig. 2). The first three types of courts (pre-A.D. 900 or 1000) and the first two Anasazi great kivas (pre-A.D. 1000?) occur only in a few Hohokam and eastern Anasazi sites, according to present evidence. The same applies to the third great kiva types, such as Casa Rinconada, which seems to have been in use by the early to middle 1000s (Vivian and Reiter, 1960, p. 103). All served as intercommunity lodges for nearby villages. Many of the Mogollon in the 900-1000s adopted a rectangular great lodge, patterned after their houses, for their *intracommmunity* structure (Breternitz, 1959, p. 72; Bluhm, 1957, p. 25; Martin et al., 1957, pp. 13-22). The last of the four ball courts, which appeared in the Sedentary Period, served more as an intracommmunity structure as did the last of the four great kiva types constructed in the late 1000s, such as those associated with the large pueblos in Chaco Canyon (Vivian and Reiter, 1960, p. 103).

These comparable changes among the Hohokam and eastern Anasazi *intracommmunity* structures and settlement patterns certainly suggest that regulated diffusion (a functionally related complex of traits) was in operation over a good period of time. It evidently was stronger than contacts between the Hohokam and western Mogollon who, after A.D. 900 or 1000, seem not to have adopted an intracommmunity structure, preferring to continue with the intercommunity rectangular lodge which also was adopted by
the eastern Mogollon across the line in New Mexico.

The intercommunity great kiva among the eastern Anasazi in the early 1000s, like that at Casa Rinconada, plus the incorporation of one or two intracommunity great kivas in the pueblos of the late 1000s, such as at Pueblo Bonito in Chaco Canyon, coincide with the rapid cultural development that took place at Chaco. These structures were not adopted to any extent by the western Anasazi west of a line roughly drawn just west of the Arizona-New Mexico boundary in the Anasazi region. However, the little kiva (kin lodge) and arc of rooms, which seem to be slightly earlier among the western Anasazi, did diffuse east and south to the eastern Anasazi by Pueblo II times (ca. A.D. 900) and were incorporated into the existing pattern with intercommunity structures. The above discussed events, from the entry of the Hohokam to the rise of Chaco Canyon in the middle 1000s is my interpretation of what occurred.

Recent references to Chaco Canyon and its "outlier" sites of the A.D. 1050-1150 period, as well as the appearance of new traits believed to have been derived from mesoamerica (Lister, 1978), have drawn much attention. In my mind, it raised a question--the title of this article. Do we have to reach south into mesoamerica as a source to explain such traits in Chaco Canyon? If the series of events relating to the Hohokam outlined above are valid, could the Hohokam, with a frontier mesoamerican-derived pochteca system, have been just another link in the series of chain reactions of transmittals north out of central Mexico that eventually reached the Chaco Canyon area?

The Chacoan settlement pattern of this period appears to be somewhat similar to that of the contemporary Hohokam. Though the Chaco type sites away from Chaco Canyon are termed outliers and are mostly within the boundaries of the Chaco Branch, some, which I prefer to call colonies, are located in non-Chacoan areas (Marshall et al., 1979, p. 12a), much like the Hohokam arrangement. In addition, intracommunity great kivas are present at all of the contemporary Chaco core area and most of the outlier sites, much like the intracommunity Casa Grande ball courts are associated
with the core area Hohokam sites and most of their colonies. That there was some type of long term contact between the Chaco area and the Hohokam, which would allow for the transmittal of ideas and material, also is evident in the presence of Gallup Black-on-white at the Sacaton Phase Gatlin site near Gila Bend (Wasley, 1960, p. 245), the earlier occurrences of Kiatuthlanna and Red Mesa Black-on-white (Haury, 1976, p. 328) and White Mound Black-on-white at Snaketown (Gladwin et al., 1937, p. 213), including the latter type in the Salt River Valley (Schroeder, 1940, fig. 11).

Comparing the mesoamerican traits among the Hohokam prior to the Classic Period with those at Chaco Canyon, as listed by Lister (1978) in the left hand column that follows, reveals further interesting similarities.

### Imported Items

<table>
<thead>
<tr>
<th>Item</th>
<th>Hohokam Phase</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper Bells</td>
<td>Sacaton</td>
<td>Gladwin, et al., 1937, pl. cxxxiii</td>
</tr>
<tr>
<td>Macaw</td>
<td>Pioneer Period to at least A.D. 900</td>
<td>Haury, 1976, p. 376</td>
</tr>
<tr>
<td>Mosaic Mirrors</td>
<td>Gila Butte to Sacaton</td>
<td>Gladwin et al., 1937, pls. cix-cx</td>
</tr>
<tr>
<td>Conch Trumpet</td>
<td>Sacaton</td>
<td>Gladwin, et al., 1937, pl. cxxii</td>
</tr>
</tbody>
</table>

### Other Items

<table>
<thead>
<tr>
<th>Item</th>
<th>Hohokam Phase</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bone pins with ornamental heads</td>
<td>Santa Cruz to Sacaton</td>
<td>Gladwin et al., 1937, pl. cxxviii</td>
</tr>
<tr>
<td>Ceremonial canes</td>
<td>Gila Butte to Santa Cruz (as shown on pottery)</td>
<td>Gladwin et al., 1937, fig. 112</td>
</tr>
<tr>
<td>Turquoise</td>
<td>Pioneer Period to Sacaton</td>
<td>Gladwin et al., 1937, fig. 52</td>
</tr>
<tr>
<td>(Not considered as a mesoamerican related item here)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cloisonne (or pseudo)</td>
<td>Gila Butte to Sacaton</td>
<td>Gladwin et al., 1937, pls. cix-cxl</td>
</tr>
<tr>
<td>Shell beads</td>
<td>Pioneer Period to Sacaton</td>
<td>Gladwin et al., 1937, fig. 38</td>
</tr>
<tr>
<td>Other Items</td>
<td>Hohokam Phase</td>
<td>Source</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>---------------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>Mosiacs (shell, turquoise, plaques)</td>
<td>Pioneer Period to Sacaton</td>
<td>Gladwin et al., 1937, pp. 131, 146, pl. cx</td>
</tr>
<tr>
<td>Water control devices (Includes dams, canals, ditches, dipping pools, wells)</td>
<td>Pioneer Period? to Sacaton</td>
<td>Haury, 1976, p. 125, figs. 8, 12</td>
</tr>
<tr>
<td>Reservoirs</td>
<td>Santa Cruz &amp; Sacaton</td>
<td>Raab, 1975, p. 305</td>
</tr>
<tr>
<td>Cylinder jars (or beakers)</td>
<td>Sweetwater to Sacaton</td>
<td>Gladwin et al., 1937, figs. 108-109</td>
</tr>
<tr>
<td>Effigy vessels (pottery) (stone)</td>
<td>Sweetwater to Sacaton</td>
<td>Gladwin et al., 1937, fig. 109; Haury, fig. 12.1</td>
</tr>
<tr>
<td>Handled incense burner (with lid)</td>
<td>Gila Butte &amp; Santa Cruz (without lid)</td>
<td>Gladwin et al., 1937, pls. lxi-lxxvi</td>
</tr>
<tr>
<td>Platform structure</td>
<td>Snaketown? to Sacaton</td>
<td>Haury, 1976, figs. 11.26, 11.31</td>
</tr>
<tr>
<td>Seating disc for roof support</td>
<td>Sacaton</td>
<td>Wasley, 1960, p. 261; Haury, 1976, pp. 82-89</td>
</tr>
<tr>
<td>Signal Stations</td>
<td>Santa Cruz to Sacaton</td>
<td>Schroeder, 1940, pp. 61-63 (so-called boulder sites on high mesas or hills)</td>
</tr>
<tr>
<td>Architectural alignments</td>
<td>Gila Butte to Sacaton</td>
<td>Ball courts imply such knowledge</td>
</tr>
</tbody>
</table>

Obviously, the above Hohokam-Chaco "mesoamerican" type traits were earlier among the Hohokam in southern Arizona.

Other traits noted by Lister and not recorded to date among the Hohokam include:

<table>
<thead>
<tr>
<th>Items at Chaco</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altar in central court</td>
<td>Platform mound in a plaza at the Sacaton Phase Gatlin site may be comparable (Wasley, 1960, p. 247).</td>
</tr>
<tr>
<td>Items at Chaco</td>
<td>Remarks</td>
</tr>
<tr>
<td>--------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>Rubble core masonry</td>
<td>Can the .75 to lm. thick and as high &quot;boulder site&quot; walls of rubble be considered comparable? (Schroeder, 1940, pp. 61-62). Rubble-filled walls at the Fortified Hill site near Gila Bend, dating post-1150, suggests prior knowledge (see Greenleaf, 1975, p. 276).</td>
</tr>
<tr>
<td>Square columns</td>
<td>Were the Chaco colonades derived from earlier timber supported porches in front of the pueblo?</td>
</tr>
<tr>
<td>T-shaped doorways</td>
<td>Di Peso (1956, figs. 14, 15), in reconstruction drawings, indicates doorways that are narrower at the lower half of the entry than the upper framed walls of the entry.</td>
</tr>
<tr>
<td>Stamps or seals</td>
<td>Nothing comparable among the Hohokam.</td>
</tr>
<tr>
<td>Turkey burials</td>
<td>Turkeys were found among the Hohokam, but not in burials.</td>
</tr>
<tr>
<td>Roads</td>
<td>I am considering these to be formalized trails. Undoubtedly trails existed in and out of the Hohokam area. Only visible in desert Pavement today.</td>
</tr>
</tbody>
</table>

On the opposite side of the ledger are a number of "mesoamerican" traits among the Hohokam not present at Chaco--ball court (out of which great kivas were derived?), figurine complex (including Mexican types), human and animal representations on pottery, legged vessel, ornate palette, nose plug, ear spool, heavy-walled pottery vessel, stone sculpture, and a variety of shell work. Future excavations may yield some of these traits at Chaco, or Chacoan "mesoamerican" traits not now known among the Hohokam may turn up in southern Arizona. However, a one-to-one correlation should not be expected even though a Hohokam connection seems obvious.

If the concept of pochtecas did come into the Southwest with the Hohokam in the Pioneer-Colonial Period transition, as suggested herein, and possibly as implied by burden bearers depicted on pottery as early as the Gila Butte Phase (Haury, 1976, fig. 17.2), the vehicle to establish formalized trade, develop colonies, and transmit ideas was present, and may well account for the Hohokam-Chaco connections.
In addition, the almost simultaneous abandonment of the Hohokam colonies and the collapse of Chaco culture in the late 1100s, and loss of luxury items among the surviving core area Hohokam (Schroeder, 1952, p. 327), suggest a close tie between the two groups. These events may well be the end-of-the-line reaction to events effecting the Mexico-Southwest corridor--the west coast Mexico corridor (Schroeder, 1965; 1966)--that was responsible for the introduction of northwest Mexican traits to the Hohokam. The general decline of the Chalchihuites was underway in the middle 1100s (Kelley and Kelley, 1971, p. 177), which would have had an effect near the southern terminus. At the same time, the west Mexico coast corridor was breaking down (Meighan, 1971, p. 767). If these events in Mexico were of sufficient impact to have an effect on the Southwestern organized trade operations, the collapse of such trade had to be relatively rapid since all pochtecas operating along this corridor would have been affected by any breakdown in a link along the way.

Also, probably by no coincidence, the Casas Grandes corridor into the Southwest was beginning to have a strong effect along the Arizona-New Mexico line north to the White Mountain-Zuni area, apparently replacing the Sierra Madre and west Mexico coast corridors (Schroeder, 1965; 1966; in press). These events occurred at a time when a number of population shifts, abandonments (and the demise of scattered villages near a major lodge), concentrations into large villages, and other cultural changes were taking place west of the Continental Divide in the Southwest (Schroeder, 1940, pp. 151-152; 1977, pp. 15-16). Assuming no great change in climate or precipitation patterns over such a large region, the widespread adjustments during the late 1100s not only suggest a common bond, such as a trade network, but an exceptionally heavy dependence on it to have brought about so much change in so little time.

With the collapse of the Hohokam and west coast Mexican corridor in the late 1100s and 1200s, the Casas Grandes corridor to the east became the dominant avenue of mesoamerican-type contact with the Southwest (Di Peso, 1974). This corridor brought about additional changes, affecting groups
as far north as the Zuni and Hopi country until the Casas Grandes collapsed, effectively bringing an end to strong mesoamerican influences on the Southwest.

While trade of several prehistoric items continued into historic times, it was merely unregulated diffusion by small trading parties or tribe to tribe affairs. There is no evidence of colonization of any type nor of non-resident merchants spending much time with or living among non-related groups which would allow for the introduction of major new concepts or ideas. The pochteca complex implies economic organization over a wide network for the distribution of resources rather than being dependent on a tribal venture for local needs.

According to archaeologists working in Mexico, Mesoamerican Classic Period cultures expanded north, influencing or overlaying local pre-classic-like societies, or setting up colonies, the latter two situations implying political control. Whether by pochtecas or other means, wherever changes occurred in the "Chichimeca Sea," they were relatively rapid and pronounced and not locally inspired (Weigand, 1968, p. 45; Rands, 1969, pp. 10-12; Kelley and Kelley, 1971, pp. 3, 175-177; Di Peso, 1974; Brooks, 1978, p. 95). Why should the shift from the Mexican pre-classic-like Pioneer Period Hakataya to the Mexican classic-like Colonial Period Hohokam be treated as an exception to the events and processes of the "Gran Chichimeca?"

The major result of the intrusion, however, was the introduction of a system that led to a settlement pattern of a scattered population unit in small villages around a site with a ball court, suggesting a controlled intercommunity socio-economic-religious system for each population unit. This settlement pattern diffused through the western Mogollon and Anasazi groups along the Arizona-New Mexico line and later as far north as the Akmen-Lowry area (Schroeder, 1963, fig. 1), but was not adopted by contemporary more northern and western Anasazi where each population unit concentrated into a large site shortly after the Hohokam entry (Schroeder, 1966, p. 693). It appears as though this pattern diffused in the Southwest as a complex and that the functions remained relatively untouched where adopted, but the related forms of architecture differed according to local traditions.
The Hakataya on the west, the Jornada on the east, and the Rio Grande Anasazi exhibit little to suggest that they ever adopted the practice of grouping several small sites around another with a specialized large structure.

Of those groups who adopted this settlement pattern of a population unit around an intercommunity (or intrapopulation unit) lodge prior to A.D. 1150, only those whose individual population units later concentrated into a large site without an intercommunity lodge survived into historic times. The arrangement of scattered sites around a "control center," each perhaps a miniature replication of a widespread network interchange and interdependence system, might well have collapsed when the Mexico-Southwest regional system broke down. The survivors returned to the old pattern of self-sufficient "folk culture" villages. Such change undoubtedly brought about considerable alterations in the socio-economic-religious practices of the survivors, and, in turn, would make interpretation of pre-A.D. 1150 "control center" type sites through use of modern ethno­logical parallels almost impossible.

Thus, this outline suggests that after the entry of the Hohokam, we do not have to look for pochtecas to leap out of mesoamerican centers to affect the Chacoan area, but merely to the Hohokam where the last and most northern mesoamerican footprints seem to have left their imprint prior to Chaco's ascendancy. As Erik Reed used to comment, if I recall correctly, "It is too bad that the United States acquired the Gadsden Purchase. If they hadn't, the Hohokam would have been in Mexico where they belong."

Santa Fe, New Mexico
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INTRODUCTION

Recent research carried out by the Chaco Project has yielded a considerable amount of information on environment, chronology, architecture, and settlement unavailable to past students of Chacoan archaeology. Although we have not yet achieved a definitive understanding of the complex developments which characterized the emergence of the Classic Period in Chaco Canyon, we feel it appropriate at this time to codify some of our interpretations of these events based on the information available to us currently.

The peak of developments in Chaco Canyon took place during the "Bonito Phase," a term coined by Gladwin (1945). The Chaco Project has sub-divided this period into the Early (A.D. 920-1020), Classic (A.D. 1020-1120), and Late (A.D. 1120-1220) Bonito Phases (Toll, Windes, and McKenna, 1980, p. 95). Several attributes serve to distinguish Bonito Phase structures, including their planned layouts, multi-story construction, distinctive masonry, and very large rooms and kivas (Lekson, 1978). The emergence of this constellation of attributes in the early tenth century contributes to the qualitative distinction of the Bonito Phase sites from contemporary developments on the Colorado Plateau.

It is perhaps this uniqueness which has prompted some archaeologists to suggest Mexican influence as primarily responsible for the emergence of the Chacoan phenomenon (cf. Vivian, 1970, and Hayes, n.d. for a review of these concepts). While recognizing influence from Mexico as a possibility, recent research has focused on alternatives which emphasize the emergence
of the Bonito Phase as a more local phenomenon developing "independently" within the geographical region now known as the San Juan Basin. Vivian (1970), Grebinger (1973), Irwin-Williams (1977), Judge (1979), Altschul (1978), Toll (1978), Schelberg (1979), Tainter and Gillio (1980), Cordell (1980), and Winter (n.d.) represent a variety of recent approaches to the problem, most involving indigenous development within a regional frame of reference.

With few exceptions, all of the foregoing models are quite general in nature. In our view, the need now exists to address specific aspects of the development of the Chaco phenomenon in some detail. We have chosen what we consider a critical aspect, the emergence of the Early Bonito Phase in the tenth century A.D., for examination here. Further, as a result of the Chaco Project's work in the past several years we now have new data concerning past climate, chronology, and architecture which are of direct relevance to this issue.

As will be seen, the model developed here has a strong "economic" basis, in that it deals specifically with the pooling and exchange of foodstuffs and other commodities as attempts to compensate for variability in production. We will not detail the wealth of literature on primitive economics as it relates to Chacoan archaeology. This has been summarized well by Toll (1978) and Schelberg (1976, 1978). Nor will we venture into arguments among economic anthropologists and archaeologists over the specific social correlates of past economic systems (cf. Peebles and Kus (1977), and Earle (1977) for discussion). We do, however, feel it is important to present our concept of the terms employed here.

We consider the terms trade and exchange to refer to the "movement of goods between hands" (Polanyi, 1957, p. 266). The basic mechanisms of transaction are reciprocity, redistribution, and market exchange. For our purposes these can be viewed as a continuum, with reciprocity at one end and market exchange at the other (Lamberg-Karlovsky, 1975, p. 345). Other terms we will use such as "pooling," "share-out," etc., can be considered varieties of reciprocity or redistribution, and these, as well as the basic
mechanisms themselves, will be defined within the specific context of usage as we encounter them.

The term "alliance network" will describe the direction(s), distance(s), and loci over which exchange takes place. It is important to note that different commodities exchanged (e.g., cultigens, meats, non-foodstuffs, exotics) may involve different mechanisms of exchange and different alliance networks. The combination of a particular mechanism and a particular alliance network will be referred to as an "exchange system."

Finally, a word about the social correlates of specific exchange systems. We wish to emphasize at the outset that no specific type of social organization need be equated with any of the exchange systems under discussion. A number of authors have addressed this issue, primarily in response to Service's (1962) equating redistribution with chiefdoms. For example, Dalton (1975, p. 92) points out that any economy may use a variant of more than one mechanism. Lamberg-Karlovsky (1975), Earle (1977), and Peebles and Kus (1977) all discuss the problems involved in assuming the association of a specific type of social organization with certain exchange systems. Toll (1978, p. 81) notes that markets are not necessarily dependent on chiefly precursors, and thus provide an interesting alternative in a situation like the Bonito Phase where the prerequisites for formalized exchange exist in the absence of direct evidence of social elites. Again, we intend to discuss possible mechanisms of exchange developing in Chaco without implying any specific social correlates.

ENVIRONMENTAL CONSIDERATIONS

The environment of Chaco Canyon and most of the surrounding region can be characterized as semiarid with high variability and low predictability in the spatial and temporal distribution of precipitation (e.g., Schelberg, 1979). Temperature variations are extreme and at Chaco Canyon the frost-free season ranges from ca. 70 to 180 days with a mean of ca. 120 days. Annual precipitation also fluctuates considerably with records at Chaco Canyon since 1950 showing a range of 85 mm. to 350 mm. with a mean of 209 mm.
This climatic variability shows that most of the Chaco region is decidedly marginal for agricultural production. Success in farming endeavors was probably difficult to predict and variable not only from year to year but also with respect to geography and micro-environmental setting.

Within the general homogeneity of the central basin, however, Chaco Canyon itself represents an area of relatively high ecological diversity. Topographic relief within the Canyon is as much as 150 m., and the adjacent Chacra Mesa to the east currently supports a relatively dense pinyon-juniper woodland. Thus a diversity of plant and animal resources would have been available to prehistoric occupants of the area, at least before man himself began to alter the ecosystem.

Relevant to our discussion is the particular configuration of drainages in the immediate Canyon area. The Chaco River itself is the primary drainage, deriving from headwaters some 50 km. to the east. Several tributaries converge within a short (less than 20 km.) length of the canyon to more than double the drainage area of the Chaco. The largest of these are the Escavada and Fajada Washes, which respectively drain extensive areas to the northeast and southeast of the canyon (Love, 1980; DeAngelis, 1972). Other major drainages are the Gallo, South Gap, Padilla, and Kin Klizhin Washes (Fig. 2). Put differently, the length of the Chaco between the major sites of the Una Vida on the east and Penasco Blanco on the west collects from a very extensive and diversified drainage basin. Given the spatial variability of intensive summer rains, it is common to see some of these drainages running while others remain dry (Love, 1980). The main Canyon area, then, is a geographical location which maximizes the potential for capturing runoff from highly variable summer precipitation through the distribution and extent of lateral and headwater drainages (cf. Grebinger, 1973, p. 9). Relative to the San Juan Basin as a whole, Chaco Canyon is atypical in this respect.

A considerable amount of paleoclimatic work has been carried out in the Basin recently, particularly with respect to interpreting past moisture regimes. In a semiarid ecosystem of this nature, available moisture would have been the most critical environmental variable to prehistoric
populations. Recent efforts at climatic reconstruction for the time periods of interest here include those of Euler et al. (1979), based on a variety of paleoclimatic indicators, and Dean and Robinson (1977) and Martin Rose (Robinson and Rose, 1979), based on an analysis of tree-ring data. Of these, the work of Rose is the most detailed. For the period from A.D. 900 on, he has provided a multivariate statistical retrodiction of annual, winter, spring, and summer rainfall for various climatic regions. Examination of these data for the Chaco area indicates "peaks" of increased summer precipitation around A.D. 910, 950, and 970, among others. It is also evident that summer precipitation does not always correlate with annual precipitation, thus an analysis based on only the latter may mask significant variability in available moisture. Summer precipitation is, of course, of primary importance to horticulture.

Euler et al. (1979, fig. 5), in summarizing the regional paleoclimatic data, suggest a major period of drought from ca. A.D. 850 to 900. By A.D. 900, according to their data, the moisture regime was improving again. However, Dean and Robinson (1977) present dendroclimatic evidence which suggests that the late ninth century drought was not particularly evident in the San Juan Basin. Departures of decadal tree-ring indices for Chaco Canyon and the Chuska Valley for this time span are generally positive, indicating that conditions were more often wetter rather than more arid. However, this does not necessarily mean that critical late spring and summer rainfall was higher. At present, then, we are uncertain about the nature of moisture conditions prior to A.D. 900.

CULTURAL DEVELOPMENTS IN CHACO CANYON A.D. 500-900

In general, cultural developments in Chaco during the Basketmaker III and Pueblo I periods parallel those taking place elsewhere on the Colorado Plateau, including the emergence of surface structures for both storage and habitation, and shifts in the location, size, and structure of villages to reflect increasing reliance on horticulture. We will examine these developments in some detail based on Hayes' (n.d.) analysis of the inventory survey carried out by the Chaco Project. A comparison of Hayes'
survey chronology and the revised Bonito Phase chronology is shown in Figure 1.

Site Frequency/Demography

A total of 135 Basketmaker III habitation sites was recorded by the survey, although Hayes felt that many sites on the canyon floor had been buried by alluvium, perhaps twice the number actually recorded (n.d., p. 41). There were more Basketmaker sites located on the mesas bordering the Canyon than any sites of the succeeding time periods, thus in all probability Basketmaker sites were fairly evenly distributed throughout the topographic diversity of Chaco.

During the Pueblo I period, habitation site frequency increased to 373, only 73 of which yielded evidence of prior Basketmaker occupation. Further, a trend toward decreased use of the mesas for habitation was apparent. This trend continues and by late Pueblo II times, by far the majority of the habitation sites were located in the bottomlands. Spatial clustering of the sites was observed, particularly in the Fajada, South Gap, and Padilla Wash areas. Pueblo I sites in the latter reached a density of 12 per km.² (31 per mi.²).

For the early Pueblo II period which began around A.D. 900, site frequency decreased slightly to 353 habitation sites, distributed much the same as the Pueblo I sites. Spatially the sites continued to cluster as before along the Chaco and the lower portions of its major tributaries. Site density in the general area of Pueblo Bonito increased to 15 per km.² (38 per mi.²). Hayes noted that there were fewer but larger site communities at this time.

Although site frequency had evidently stabilized by early Pueblo II, the population of the Canyon area continued to increase. Hayes (n.d., fig. 26) has reconstructed the population of the Canyon for the Anasazi period based on a combination of site frequency, room counts, and several constants derived from ethnographic reports. He estimates the population for each time period as follows: Basketmaker III, 1,053; Pueblo I, 1,674;
Figure 1. Correlation of Chronologies used in this Paper

aHayes (n.d.)  bToll, Windes, and McKenna (1980)
Pueblo II, 3,240; and early Pueblo III, 5,652. Thus while habitation site frequency increased from Basketmaker III to Pueblo I, then actually declined slightly through the Classic Bonito Phase, population in the Canyon increased by some 537% for the same period. This, of course, is accounted for largely by an increase in room frequency per site through time.

Although it seems evident that population increased in Chaco Canyon during the period in question here, it is not clear how this compares with demographic change elsewhere in the Pueblo area. Cordell and Plog (1979, pp. 413-416) review the current evidence, which suggests a general increase from A.D. 1 to 700, and a decrease from A.D. 700 to 1,000. However, they doubt the reliability of the latter and suggest population may have stabilized instead, while settlements became more dispersed. In either case, it may be that Chaco Canyon experienced a relatively greater increase in population from the sixth to 11th centuries than did other Anasazi areas. Since Hayes did not attempt to estimate population by each century, details on ninth century demography in Chaco are not presently known. It is possible, however, that the population could have stabilized in late Pueblo I times.

Subsistence

Subsistence pursuits in Chaco Canyon during the eighth and ninth centuries were probably quite similar to those elsewhere. Settlement shifts, such as the reduction of habitation site loci on elevated mesa areas following Basketmaker III, suggest increasing reliance on horticulture as a subsistence base. There is no direct evidence of water-control mechanisms in use during these time periods, however. In all probability, farming was of the floodwater type done in akchin fields (Bryan, 1929; Hack, 1942) similar to those of the modern Hopis.

Hunting and gathering undoubtedly continued as important regular components of the diet. At this point we wish to echo the current archaeological view that Anasazi subsistence systems were probably much more complex than previously thought. In addition to primary reliance on cultigens, game, and gathered wild plants as more or less dependable
resources, a variety of "buffering mechanisms" (i.e., cultural strategies invoked to dampen the effects of environmental oscillations, cf. Jorde, 1977) were undoubtedly maintained in reserve to meet unanticipated demands that arose when failures occurred in the primary resource base. The actual degree of dependence on cultigens versus gathered plants within the primary base would depend on a variety of cultural and environmental factors, as would the nature and number of buffering mechanisms maintained or invoked at any particular time. Thus depending on both general and local environmental conditions, the primary subsistence base was composed of a specific array of domestic and wild resources which produced relatively dependable yields. Buffering mechanisms were invoked when anticipated yields did not materialize.

A number of factors would contribute to unanticipated reductions in productivity and thus tend to stress the subsistence system. Foremost, of course, were the summer rainfall patterns which varied considerably in both intensity and location. Other factors, such as length of growing season, soil chemistry, wind, hail, insects, other animals, and raids, would also contribute (Ford, 1972a, pp. 3-6). In addition, long-term variability in annual moisture, apparent retrospectively in the paleoclimatic record, would have produced less immediate, but equally important long-range effects.

Social Processes

A number of options would have been available to Basketmaker and early Pueblo populations in response to reductions in productivity of the subsistence systems. One category of responses would involve effecting changes in the primary subsistence systems, e.g., increase the amount of hunting, increase gathering of wild plants, or somehow intensify the production of cultigens. In Flannery's (1968) terms, these might be considered rescheduling major components of the procurement system. Another category of options would involve use of the buffering mechanisms, e.g., either move people to a place where there were surplus resources or move
surplus resources to the people. In the first case, the "mobility" option, an entire village or some subset thereof, might move to a more favorable area (Ford, 1972a, p. 15; Schroeder, personal communication). Mobility of this type is sometimes referred to as "budding" although it need not always occur under conditions of subsistence stress. Another type of mobility might involve a family, or portions thereof, simply moving to another village for a period of time to temporarily relieve the problem.

In the second case, there was the general option of moving the resource to the people, i.e., exchange of foodstuffs for some other commodity, or to incur a debt for foodstuffs to be repaid at a later date. Exchange of this nature can be termed reciprocity, specifically "balanced reciprocity" in the sense used by Sahlins (1972, pp. 194-195), and Ford (1972a, p. 9). In balanced reciprocity, the exchange is equal even though payment may be delayed. There is no profit intended by either side. As such, it generally characterizes egalitarian social systems, but is not limited to them. As Ford (1972b) has shown for modern Tewa pueblos, reciprocal exchange of non-food commodities served to maintain valuable links which could be invoked for food during times of famine. Undoubtedly exchange networks of this type existed prehistorically (cf. Di Peso et al., 1974; Glassow, 1977; Cordell and Plog, 1979; S. Plog, 1980a).

Here we are considering exchange of foodstuffs primarily, in response to subsistence stress. Such exchange would not occur randomly but instead probably along lines established by pre-existing social alliances. It is likely that a relatively intricate system of such alliances was maintained between villages within the San Juan Basin throughout the Anasazi period, forming the basis for particular exchange systems to be effected at any given time in response to a variety of needs.

These social alliances would have been important to other subsistence stress responses besides reciprocal exchange. Residential mobility, for example, would probably be directed to existing alliance locations whether complete or partial social units were involved. By the same token, increased reliance on gathered wild plants, would increase competition for select areas
thus favoring alliance ties with those who controlled access to such areas. Recently, archaeologists have attempted to identify prehistoric exchange networks through the analysis of ceramic styles (S. Plog, 1980a) and other ceramic attributes (Toll, Windes, and McKenna, 1980). However, such analyses have not been completed yet in Chaco for the time periods in question here.

Summary: A.D. 500-900

To recapitulate cultural developments in Chaco prior to the tenth century A.D., it was noted that site frequency increased significantly from Basketmaker to Pueblo I times. An estimated 80 percent of the Pueblo I sites in Chaco were new, that is, were not built over a prior Basketmaker site. Site frequency then stabilized and began a slight decline during the Pueblo II period. Few new sites were built, in fact 91 percent of the Pueblo II sites showed prior Pueblo I occupation (Hayes, n.d., p. 47). Site frequency notwithstanding, the estimated population in Chaco showed a marked increase throughout the period, although the details of this increase during the ninth century are not clear.

The patterning of sites changed during the period from a fairly even distribution throughout the various topographic zones of Chaco, to a definite preference for lowland locations along the Chaco and its major lateral tributaries. Clustering occurred along the Chaco at the mouths of the tributaries as well as along the lower portions of the tributaries themselves.

By the end of Pueblo I, subsistence probably consisted of primary reliance on cultigens, supplemented regularly by meats and gathered wild plants. Farming was probably of the akchin type. Water diversion systems, if in effect, were ephemeral and are no longer recognizable. Under this system, success in meeting subsistence needs was largely dependent on available moisture.

Variability in quantity and areal distribution of summer rainfall was probably the primary cause of inadequate production of both cultigens and other foodstuffs and as a result was the primary and continual source of
stress upon the subsistence system. A number of options were available to Chacoan populations to reduce this stress, though not all were of equal value. Shifting to increased reliance on non-cultigens was one option, but for Chacoan populations, hunting areas for larger game were readily accessible only to the east (Chacra Mesa). Choice hunting areas to the north, west, and south are found only at considerable distances (50 km. or more). Gathering areas were available in close proximity on the mesas bordering the Canyon, but these were limited in areal extent, and competition for access to them would have been intense in times of reduced moisture.

Buffering mechanisms in the form of residential mobility and reciprocal exchange were available as options, and were undoubtedly invoked frequently. However, assuming a general population increase throughout the basin and elsewhere during this period, mobility would become increasingly less suitable as an effective response (S. Plog, 1980b, p. 8). It is thus probable that reciprocal exchange would have been emphasized as the primary buffering mechanism for equalizing productivity when subsistence systems were under stress. The exchange itself was undoubtedly based on alliance networks previously established and maintained on the basis of kinship or other social ties. Some have suggested that, at least in the early Pueblo periods, these exchange systems would have been very broadly based (i.e., geographically extensive) in order to maximize the potential for equalizing variability in production (Bronitsky, 1976; Schelberg, 1979; S. Plog, 1980b).

TENTH CENTURY DEVELOPMENTS

Tenth century developments in Chaco Canyon, which led ultimately to the uniqueness of the Bonito Phase, were primarily the result of two basic factors: cultural developments which took place there previously and particular geological and geographical characteristics specific to the Chaco area. With this in mind, we would like to suggest some reasons for the emergence of what apparently was a new and distinctive adaptive system in Chaco in the early 900s.
Intensification

Even though moisture conditions may have been improving during the tenth century, the subsistence system of the Chaco population was still subject to stress due to variability in summer precipitation and increased population densities. Previously we outlined the kinds of options available to counteract inadequacies in crop production. As noted, not all options would have been equally effective due in part to the location of Chaco in the relatively homogeneous central portion of the San Juan Basin, and in part to the fact that residential mobility was limited as a result of regional population increase.

An option not discussed in detail previously was that of agricultural intensification, i.e., the use of new energy subsidies (Athens, 1977) in order to increase production. In a situation such as that at Chaco, the most basic methods of achieving this would be either to increase the total area under cultivation or to increase the yield per hectare.

Methods of increasing yield per hectare were probably sought continually. Among them might have been development or adoption of new plant strains, higher density planting, improving soil nutrients, or, at least in the case of corn, insuring an adequate water supply during moisture-sensitive periods of the growth cycle (Downing, 1974, p. 119). To guarantee the latter when depending on summer rains, a relatively sophisticated system of impounding water (as opposed to diverting runoff) would be necessary. Impounding systems may have existed in Chaco, but the evidence is tenuous, and in all probability would not have been operational in the early 900s. Pot irrigation, such as that practiced in the Valley of Oaxaca (Flannery et al., 1967) would have been effective and may have been used. However, it is very labor intensive and also dependent on a high water table in the vicinity of the fields.

We suggest that although these methods of increasing yield may well have been employed in Chaco Canyon, the primary method of achieving more production in the late ninth and early tenth centuries in Chaco was through increasing the amount of acreage under cultivation by expanding into the
more marginal, higher risk areas available nearby. There is some empirical support for this view. First, and most important, we noted earlier that by the tenth century the mobility option was reduced considerably as a result of general population increase throughout the Basin. Though both villages and families undoubtedly continued to move during hard times, it was probably becoming increasingly difficult to find suitable locations to move to. Also it is probable that fissioning within the Chaco area itself was minimal at this time. Hayes (n.d., p. 47) estimated that only nine percent of the early Pueblo II sites were built on new locations. This suggests that suitable acreage in the Chaco area was at a premium.

Second, it will be recalled that population in Chaco continued to increase, probably as a result of both natural growth and immigration. During periods of increasing moisture throughout a region such as the San Juan Basin, lowland areas become more suitable for cultivation and thus experience a general population increase. Chaco was probably no exception, and adequate numbers of people would have been available to provide the energy needed for cultivation of higher risk areas.

Finally, improved moisture conditions such as seen in the retrodicted increased summer rainfall around A.D. 910 would have served to lower the risk of farming more marginal areas. All of these conditions, then, would support our view that intensification through increasing acreage was the primary mechanism by which early tenth century Chacoan farmers sought to increase production.

We should acknowledge here the obvious fact that the use of water diversion devices as energy subsidies is an effective method of both making marginal areas more arable and increasing yield per hectare. Sophisticated water-diversion systems are known at Chaco (Vivian, 1972), but we have no definite evidence that they were components of this early emergent system at the beginning of the tenth century. Nor do we have evidence of the presumably ephemeral and elementary devices used to divert runoff in akchin fields (Hack, 1942, p. 28). Thus, at present, we cannot access the
role water-diversion mechanisms may have played at this early stage in the
development of the Bonito Phase, but we doubt they were of the importance

**Emergence of Central Places**

We suggest, then, that as a result of increased population density and
possibly better moisture conditions in the late ninth and early tenth
centuries in Chaco Canyon, there was a concomitant effort to bring more
marginal, higher risk areas under cultivation. This occurred both in the
Canyon proper, as well as along the major lateral tributaries noted earlier.
Undoubtedly, the results of this type of intensification would have been
highly variable, as high risk economic ventures typically are. Some areas
might be quite productive, others not so, and each would vary from season
to season. At stake would be the dependability of the return in any given
year, and certainly methods to improve the situation would be sought.

One means of equalizing highly variable yields would be to pool
resources and share the results among the contributors. "Pooling," as
a form of exchange recognized in the literature of primitive economics,
can occur at many different levels, though its most basic and frequent
form is within the primary domestic unit. At that level it was termed
"householding" by Polanyi (1957). At a higher level it has been termed
"share-out" (Earle, 1977, p. 215). Regardless of level, pooling is a
form of redistribution and thus is distinguished from reciprocity
(Sahlins, 1972, p. 158; Pires-Ferreira and Flannery, 1976, pp. 290-291).

In Ford's (1972) discussion of Tewa and Keresan pueblo subsistence
systems, he notes the presence of sodality-based redistribution of food-
stuffstuffs, primarily effected through ritual, as a mechanism of equalizing
production. Although he does not mention pooling as means of redistribu-
tion, other authors have suggested that it may have been employed prehis-
torically in the Southwest (Cordell and Plog, 1979, p. 417; S. Plog, 1980,
p. 8). Grebinger (1973, p. 13) suggests pooling may have taken place in
Chaco, but ties it closely with status differentiation and water-control
mechanisms. In any event, it seems possible that resource pooling would have been an effective way to equalize the variability in production which almost certainly would have resulted from early tenth century attempts in Chaco to bring more marginal acreage under cultivation.

To pursue this, it might be appropriate to consider the social requisites of pooling or share-out. In general, as Sahlins observed, "pooling stipulates a social center where goods meet and thence flow outwards, and a social boundary too, within which persons (or sub-groups) are cooperatively related" (1972, p. 189). In effect, pooling requires a central repository to which goods can be brought for immediate distribution, or stored for redistribution at a later time. Further, even on an elemental level, the process requires some kind of administration or management, be it by an individual or a group. This is necessary to effect planning for resource production and decide on the manner of resource distribution. If communal storage is involved, resource security is necessary. While recognizing the need for organizational authority at this emergent level in Chaco, we are reluctant at this time to attribute such talents to a "big man," "chief," or even a "local elite." Instead we will use the less status-oriented term "administrative entity."

In the sense used here, the center or repository requisite to effective resource pooling has the attributes of a "central place" as employed by locational geographers (e.g., Haggett, 1965), economic anthropologists (e.g., Smith, 1976), and archaeologists (e.g., Renfrew, 1975). Such a center would serve as a locus for the collection, communal storage, and redistribution of subsistence resources for the participating group, as well perhaps as the residence of the administrative or managerial unit. It might be noted that planning is a key aspect of both redistribution and the concept of central place. Though some central places undoubtedly grew through accretion, the emergence of others might well have involved the planned construction of adequate storage and other facilities to meet anticipated needs. While reciprocity is often reactive in the sense that it is activated on the basis of need, redistribution involves an anticipated pool of goods and the planned distribution of them.
We suggest that in order to address the needs of resource pooling, three sites were constructed to serve as central places in Chaco Canyon in the early part of the tenth century A.D. These sites were Una Vida, at the confluence of the Chaco and the Gallo and Fajada Washes; Pueblo Bonito across the canyon from the South Gap drainage; and Peñasco Blanco, near the confluence of the Chaco with the Escayada and Padilla Washes (Fig. 2). Each of these sites is recognized today as representative of the Classic Bonito Phase in Chaco. Their present configurations are the result of numerous and extensive additions to, and modifications of, the original structures. Nevertheless, each does have an original arc-shaped structure built in the early part of the tenth century. The relationship of these early components to the current structures is seen in Figure 3.

In some respects these three early structures, which according to tree-ring dates were constructed between A.D. 900 and 950, are similar to other sites found in Chaco Canyon and elsewhere during the early 900s. The arc-shaped room block facing southeast toward one or more pit structures is typical, as well as the three-room "modular" units making up the room block. The typical "module" consists of a large room in front, backed by a pair of smaller rooms.

In other quite important respects, however, these early 900s structures show notable discontinuities from the other sites. The first is that multi-storied construction makes its appearance in Chaco, if not elsewhere in the Anasazi area, at this time. The front rooms were double-stories at each of the sites, and in two cases (Una Vida, Pueblo Bonito), the rear rooms may have included three stories. Second is the distinctive masonry which characterizes the early structures, although perhaps this is more a matter of extremes than discontinuities. Early tenth century building at Pueblo Bonito, Una Vida, and Penasco Blanco utilized many of the materials, techniques, and methods of construction of late Pueblo I-early Pueblo II settlements, but evidenced a much higher degree of craftsmanship and much more massive design of walls. Judd's assessment is probably valid: "Pueblo-II stone work at its very best is to be seen in Old Bonito. It
Figure 2: Early Bonito Phase Site Locations in Chaco Canyon
Figure 3. Early Bonito Phase Architecture at Pueblo Bonito, Penasco Blanco, and Una Vida"
surpasses that of every other Pueblo-II settlement of which I have knowledge" (1964, p. 61). Third, and perhaps most important, is the difference in size between these sites and their contemporaries. Not only were both the rooms and pit structures much larger, but also the scale and dimensions of the sites themselves, as shown in Table 1. The number of modular units contained in the room blocks is indicative of this increase in scale. Contemporaneous sites contained an average of one or two of these units. At Pueblo Bonito there is evidence of five such units, and possibly as many as 11 at Peñasco Blanco.

In brief, the masonry, multi-story construction, and differences in size and scale of these sites almost certainly demonstrates a qualitative distinction in the degree of planning, decision making, and organization of labor which went into their construction. At issue here, of course, is the interpretation of their function, if indeed they served as central places for pooling and redistribution of foodstuffs. Unfortunately we lack excavated information in the case of Peñasco Blanco, and the key ramada areas at Pueblo Bonito were disturbed by 200 years of ensuing occupation. However, recent evidence obtained by the Chaco Project at Una Vida almost certainly indicates habitation function in the front, and suggests storage function in the rear, of the early 900s roomblock there.

In the absence of more detailed information, we can only suggest that the distinction of these sites from earlier small-house construction, as well as the remarkable similarity between the three sites in layout and time of construction, may well reflect a centralized design and planning process not inconsistent with administrative requisites of resource pooling and the shift from reciprocity to an emergent redistributive exchange system.

Exchange Systems

If resource pooling formed the basis for the emergence of central places in Chaco Canyon, it is evident that by the early 900s it was becoming increasingly formal. Of interest is the kind of alliance network within
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<th></th>
<th>Penasco Blanco</th>
<th>Pueblo Bonito</th>
<th>Una Vida</th>
<th>PI-early PI small sites*</th>
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<td>2-5</td>
<td>3-11?</td>
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<td>Number of rear rooms for each front room</td>
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<td>2-4</td>
<td>1-2</td>
<td>2</td>
</tr>
<tr>
<td>Approx. floor area</td>
<td>15 m²</td>
<td>8-13 m²</td>
<td>9-13 m²</td>
<td>3-4 m²</td>
</tr>
<tr>
<td>Number of stories</td>
<td>2</td>
<td>2-3</td>
<td>2-3?</td>
<td>1</td>
</tr>
<tr>
<td><strong>Pit structures</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of front rooms for each pit structure</td>
<td>?</td>
<td>2-3</td>
<td>?</td>
<td>2-3</td>
</tr>
<tr>
<td>Approx. diameter</td>
<td>?</td>
<td>6-7 m</td>
<td>?</td>
<td>4 m</td>
</tr>
<tr>
<td><strong>Length along rear wall</strong></td>
<td>120 m</td>
<td>140 m</td>
<td>105 m</td>
<td>15 m</td>
</tr>
<tr>
<td><strong>Suggested building dates</strong></td>
<td>898-916</td>
<td>919-936</td>
<td>932-950</td>
<td>ca. 900-950</td>
</tr>
</tbody>
</table>

* Preliminary estimates, Marcia Truell (personal communication).
which such formalized pooling would take place. Suggested previously was the existence, prior to the tenth century, of broad-based, extensive social alliances which could be activated as necessary for the exchange of foodstuffs to compensate for subsistence shortages. There is some evidence (see S. Plog, 1980b) that population increase, accompanied by a reduction in mobility, would have resulted in a decrease in the spatial extent of exchange spheres. The location of each of the three early Bonito Phase sites implies this may have taken place in the Chaco region with respect to the exchange of foodstuffs. Each site is situated at the confluence of one or more major lateral tributaries to the Chaco, and the capability to "control" the villages located in these watersheds would have been enhanced by these locations. We would suggest that the alliance networks represented by each of the emergent central places were defined primarily by the major lateral drainages and proximal portions of the Chaco which were "controlled" by each site. In other words, the pooling and redistribution of foodstuffs took place primarily within areas defined by the major Chaco watershed systems.

One would not expect such alliances to have developed rapidly. Undoubtedly they existed within each drainage for some time. We would expect them to increase during the tenth century as better moisture conditions, increased population, and more formalized redistribution permitted more marginal acreage to be farmed within each watershed. Increased emphasis upon more localized alliances does not imply that the wider networks would be abandoned. Though relied upon less for the exchange of foodstuffs, they would almost certainly have been maintained for the exchange of non-food commodities. We would expect, however, such networks to become less eclectic and oriented toward fewer, higher quality source areas for specific items in question. There is empirical support of this in lithic data from the Chaco Project, specifically with respect to a marked increase in frequency of a high quality, exotic chert in post-A.D. 900 Chaco sites (C. Cameron, personal communication).
CONSEQUENCES OF EMERGENT REDISTRIBUTION IN CHACO CANYON

Resource pooling and the rise of central places as redistributive loci are sufficiently distinct from energy subsidies based primarily on mobility and reciprocity to warrant labeling them as a new adaptation. As such we might examine the long-range consequences of such a development. Almost certainly, continued population increase would require further intensification within the new adaptive framework. We would expect expansion of the redistribution network to incorporate more acreage, sustained by increasingly formalized resource pooling and redistribution. During periods of increased subsistence stress, whatever the cause, intensification might well be directed toward increasing the spatial extent of the redistributive network. Indeed, as the more formal system expanded, redistribution of foodstuffs may have gradually replaced reciprocity as a means of equalizing subsistence stress over a much more extensive area. Renfrew (1975, pp. 9-10) suggests that in terms of transportation costs, redistribution is more efficient than reciprocity.

The shift from reciprocity to redistribution as an integral process in the development of complex societies is found frequently in the literature (Service, 1962; Fried, 1967; Renfrew, 1972; Sahlins, 1972). Again, however, a word of caution should be noted. To document this shift is one thing, to attribute it a specific social correlate is entirely another. As Lamberg-Karlovsky (1975, p. 343) points out, it is incumbent on the archaeologist to develop categories consistent with the integrity of the archaeological data, and not to assume an a priori social status on the basis of a particular type of exchange system.

A most important consequence of the new adaptive system would involve further development of the emergent central places. Certainly these would assume more importance as the pooling-redistributive system became increasingly formalized. Their growth would continue and would probably be effected through planned additions of major architectural units. In this context, it is interesting to recall the similarity in masonry and
other features of construction between the first three Bonito Phase structures. This similarity, and the fact that available dates indicate closely-spaced, if not contemporaneous, construction (Table I), suggests the presence of canyon-wide organization even early in the tenth century. If so, we would expect such organization to increase in formality through time as well. As more redistributive networks and alliance groups were brought into the system, Chaco Canyon itself could emerge as a central place of a different magnitude within the San Juan Basin as a whole (Judge, 1979, p. 903).

These suggested consequences of emergent redistribution in Chaco Canyon have obviously not been created *in vacuo*. Indeed, they conform closely to the developments which presumably took place during the Classic Bonito Phase in Chaco, if our interpretation of the data available there and elsewhere in the San Juan Basin is correct. It is evident that however it grew, the Chaco system eventually comprised the central canyon, and perhaps 50 or more "satellite" communities dispersed throughout the San Juan Basin and connected to Chaco by a system of roads (Marshall et al., 1979; Powers et al., 1980; Obenauf, 1980).

It may be that many of these outliers paralleled the growth of the early Bonito Phase sites in Chaco as central places within their own areas, and later were incorporated into the system. Certainly Kin Bineola, some 14 km. west of the Canyon, shows early tenth century construction. On the other hand, the system may have had general temporal and spatial primacy in Chaco Canyon and may have developed by expanding outward in the Basin from this central core. We know too little about the prehistory of most of the outliers to permit a definitive interpretation of the mechanism of system growth at this time. Whatever the case, the early tenth century developments in the Canyon resulted in a distinctive new adaptation and set the stage for the emergence of a formalized regional exchange system.

**CONCLUSIONS**

To summarize, this report has examined Basketmaker III and early Pueblo
developments in Chaco Canyon in the light of recent data compiled by the Chaco Project. The goal has been to informally model the emergence of the Early Bonito Phase in the tenth century A.D., antecedent to the well-known Classic Period.

Evidence suggests a significant increase in the population of Chaco Canyon from Basketmaker III through the Early Bonito Phase. At the same time, site frequency stabilized as sites became larger. Sites tended to cluster around the mouths and lower portions of the major lateral tributaries to the Chaco River. These major drainages capture diverse and extensive watersheds on either side of the canyon, thus maximizing the potential of benefiting from variable, scattered summer rainfall and runoff.

Due to this variability in location and intensity of summer rainfall, Anasazi subsistence systems were continually subject to stress. During periods of reduced moisture, this situation intensified. For Basketmaker III and Pueblo I populations, two means of addressing this problem were to move residences to more favored locales, or to equalize variability in production through reciprocal exchange of foodstuffs through broadly-based alliance networks. However, in the early tenth century, population increase had reduced the option of residential mobility as an effective method of meeting shortages. Better moisture conditions in the early 900s favored another option, that of bringing more marginal, higher risk areas, within the canyon watersheds under cultivation. To compensate for this higher risk, the variable yields which resulted were equalized through communal pooling, storage, and redistribution of resources among the contributors. This process led to a gradual, but positive shift from reciprocal exchange to redistribution, and a concommitant emergence of the pooling-repository locations as formal "central places."

We suggest three such centers were constructed in Chaco Canyon between A.D. 900-950, namely the early components of Peñasco Blanco, Pueblo Bonito, and Una Vida. All are similar in size and distinctive architectural attributes, and differ qualitatively from contemporaneous sites in the Chaco area. Their planned construction is consistent with the level of
organization necessary for the operation of redistributive exchange systems, and presumably involves an administrative or managerial unit. The location of each site is such that it could "control" one or more lateral tributaries. Presumably, then, pooling and redistribution of foodstuffs took place within the Chaco watersheds. We would add that parallel developments might well have been taking place elsewhere in the San Juan Basin in similar locations.

Once the shift to redistribution had taken place, the consequences of this effective, new adaptation would be far-reaching. Assuming continued population increase, the pooling-redistribution network would become more formalized and more extensive, eventually replacing reciprocity as a regional means of equalizing variability in resource production. The initial central places would themselves become increasingly important. Major planned additions would be constructed, as well as additional sites at other favored locations. Due to its location in the San Juan Basin, Chaco itself would be likely to develop into a central place of a higher order. However, this, as well as the ultimate collapse of the system, must be the subject of another report.

Finally, we have been careful in this paper not to attribute any specific social status to any individual or group that might have been involved in the emergence of complexity in Chaco. There are several reasons for this. First, as noted previously, archaeologists have at times too readily assumed that a certain social status must correlate with evidence of formal exchange. Second, although we are well aware of the dangers inherent in the abuse of ethnographic analogy, the fact remains that modern Pueblos comprise primarily egalitarian social systems. Third, apart from the presence of one or two possible "high status" burials at Pueblo Bonito, empirical evidence that status differentiation thoroughly characterized Chacoan society is inadequate at present.

We fully agree that status may have been important in Chaco, but until definitive evidence is found, we must continue to consider possible alternatives. As such, we are currently evaluating the possibility that an
incipient market system may have developed at Chaco (cf. Toll, 1978). Pooled resources available to some group other than the contributors, perhaps in exchange for non-food commodities, would foster an emergent market system. Further, such a system would possess the formal attributes characteristic of redistributive systems, but would not necessarily depend on status differentiation in the central places in order to operate effectively. It may, then, provide an alternative model which fits the data more closely.

We make no claim that the suggestions offered here will guide archaeologists to an ultimate understanding of the development of the Chacoan phenomenon; only that they seem to us to comprise a reasonable approach which is consistent with the data available to us at this time, and one we shall continue to develop and modify as more information becomes available.

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THE CURRENT STATUS OF REDWARES
IN THE MESA VERDE REGION
WILLIAM A. LUCIUS and DAVID A. BRETERNITZ

INTRODUCTION

The basic question of whether the redwares in the Mesa Verde region of the Anasazi were produced locally or occur as the result of trade has been with us for some time. Erik Reed, as much as any single person, has been involved in this controversy. The history of this query, Reed's involvement and contributions, and the current state of knowledge are the subject of this paper.

The Mesa Verde region of the northern Anasazi can be sub-divided into districts for purposes of discussion (Fig. 1). These districts represent spatial divisions that are expected to exhibit internal consistency in cultural expressions and display sufficient traits to distinguish them from adjacent areas, all the time exhibiting continuity that allows for their placement into the larger category of Mesa Verde Anasazi. The preponderance of data concerning the redware question have emanated from work conducted in or near Mesa Verde National Park (Mesa Verde District). The lack of comparable data from other districts of the Mesa Verde region has contributed to the lack of progress in the determination of the location of redware manufacture.

Ongoing investigations of ceramic artifacts at the Dolores Archaeological Program (D.A.P.) has allowed for examination of a large body of redware ceramics in the area north and west of Mesa Verde National Park.

PREVIOUS WORK

How the problem has been addressed in the past is germane, and of interest, although it is not necessary to treat every worker with equal ink--the contributions to the questions obviously vary in scope, depending on the author, his interests, and when the thoughts were set down on paper.
THE NORTHERN SAN JUAN AREA
ARCHAEOLOGICAL REGIONS AND DISTRICTS

EXPLANATION
REGIONAL BOUNDARY
DISTRICT BOUNDARY
WESTERN DISTRICT
YELLOWJACKET DISTRICT
RIVER DISTRICT
MESA VERDE DISTRICT
LA PLATA DISTRICT
GRAND GULCH DISTRICT
DURANGO DISTRICT
Martin (1936, p. 80) is perhaps the first worker to concern himself with redwares of the Mesa Verde, and Morris (1939) contributed thoughts soon after. Hargrave (1936) began to recognize redware "varieties." Brew (1946) is involved, especially as regards a discussion of Abajo Red-on-orange and its definition, based on excavations on Alkali Ridge in southeastern Utah (Western District). Reed presents the first real concern regarding the question of local versus non-local manufacture of the redwares. His work was done, basically, in the early 1940s although general distribution of his thoughts did not appear until 1958 (Reed, 1944, 1958). His contention was that the early redwares (Abajo Red-on-orange and Bluff Black-on-red) are intrusive.

In the meantime, Abel (1955) set up San Juan Red Ware to include Abajo Red-on-orange, Abajo Black-on-gray plus the polychrome variety, Bluff Black-on-red, and La Plata Black-on-red. The latter is considered a Mesa Verde version of Deadman's Black-on-red.

Colton (1956) attempted to recognize and describe the redwares from the northern Anasazi and separated the known types into wares and series, as follows:

San Juan Red Ware
San Juan Series
   Abajo Red-on-orange
   Abajo Polychrome
   Abajo Black-on-gray (now recognized as reduction-fired Abajo Red-on-orange)
   Bluff Black-on-red
   La Plata Black-on-red

Little Colorado Series
   Deadman's Black-on-red
   Middleton Black-on-red
   Middleton Red
   Nankoweap Polychrome
   Amosovi Polychrome
   Machompi Polychrome
Tsegi Orange Ware
- Medicine Black-on-red
- Tusayan Black-on-red
- Cameron Polychrome
- Citadel Polychrome
- Tsegi Orange
- Tsegi Red-on-orange
- Tsegi Black-on-orange
- Tsegi Polychrome
- Tusayan Polychrome
- Dogoszhi Polychrome
- Kayenta Polychrome
- Kiet Siel Polychrome
- Kiet Siel Black-on-red
- Jeddito Black-on-orange
- Jeddito Polychrome
- Klageto Black-on-yellow
- Klageto Polychrome
- Kintiel Black-on-orange
- Kintiel Polychrome

When Reed's Mancos Canyon work was finally published in 1958, he divided the redwares into two wares and three series (following the Colton taxonomy):

San Juan Orange Ware
- Alkali Series (Montezuma Orange Ware)
  - Abajo Red-on-orange
  - La Plata Black-on-orange (should be in Deadmans Series?)
  - Unnamed minor sub-types
  - Bluff Black-on-red

Deadmans Series (San Juan Redware)
- Deadmans Black-on-red
- Tusayan Black-on-red
- Citadel Polychrome

Tsegi Orange Ware
- Tsegi Series
  - Tusayan Polychrome and related types

Reed states (1958, p. 69) that in the early period, oranges and black-on-reds were made in southwestern Colorado, rather than being imported, and that the red-on-oranges were initially the result of accidental refiring and/or oxidation (Ibid., p. 125).
In their 1974 publication, Breternitz, Rohn, and Morris divided the redwares into four "types": Abajo Red-on-orange, Abajo Polychrome, Bluff Black-on-red, and Deadmans Black-on-red (the latter being the La Plata Black-on-red of Abel [1955]).

Hayes and Lancaster (1975) discuss redwares and summarize the state of knowledge at that time, based on materials from Badger House within Mesa Verde National Park. They summarize Reed (1958) by suggesting reductions of San Juan Redware into two types:

1. Abajo Red-on-orange, as described by Brew (1946)
2. Bluff Black-on-red, which includes La Plata Black-on-orange (Martin, 1939); La Plata Black-on-red (Morris, 1939); and Sandstone Black-on-orange (Hawley, in Kluckhohn and Reiter, 1939).

As in Hargrave (1936) and Colton and Hargrave (1937), Hayes and Lancaster (1975, p. 137) indicate that for Abajo Red-on-orange, the eastern variety is black-on-red (Bluff Black-on-red) while the western variety is indeed red-on-orange (Abajo Red-on-orange). In the same discussion they go on to say that redware apparently originates in the western portion of the region.

Rohn (1977) also addressed the question in his treatment of redwares of the Mesa Verde. Utilizing materials from the survey of Chapin Mesa, Mesa Verde National Park, he designates Abajo Red-on-orange (with polychrome black-on-gray deviations): Bluff Black-on-red: Bluff Variety (unslipped); and Bluff Black-on-red: La Plata Variety (slipped) as the Mesa Verde redwares.

THE TYPES

The types recognized as belonging to San Juan Redware by the Dolores Archaeological Program follow Breternitz et al. (1974). The types being referred to in the following discussion can be summarized in terms of paint color, surface treatment, and painted stylistics.
Abajo Red-on-orange, the initial type of the ware, appears during the Basketmaker III occupation of the Mesa Verde region and takes its name from the presence of a red iron-rich paint applied in simple geometric patterns on bowls and jars (Brew, 1946, p. 254). Vessels are always polished, are without slips or washes, and are commonly painted on the flattened portion of the tapered rims of bowls.

Bluff Black-on-red (Hargrave, 1936) apparently develops from Abajo Red-on-orange and varies from it primarily in design elements and formats. Broad line designs and occasional life forms are common. Vessel wall thickness increases and surfaces are generally better prepared than in the earlier type. Paint color changes from red to dull black, perhaps indicating the use of manganese-rich paint sources.

Deadmans Black-on-red (Breternitz et al., 1974) exhibits finely polished surfaces with red slip. Designs are well-executed using fine line hatching and filler elements in black paint.

**DATING**

Abel (1955) places the inception of redware production in the Mesa Verde region by A.D. 650, and Breternitz et al. (1974) place its beginning at approximately A.D. 700. Current analysis of the D.A.P. collections indicates an A.D. 750 date for its introduction into the Dolores River area. Bluff Black-on-red consequently dates to between A.D. 800 and 900 to be followed by Deadmans Black-on-red during the Pueblo II period and ending prior to A.D. 1000. Confident dating of the types is mitigated against by the difficulty in placing the majority of archaeologically derived sherds into one of the type categories and by the paucity of sites with redware ceramics in well-dated contexts.

**ORIGINS**

"Theoretically, the orange came first as the people of the south had been long making it" (Colton, 1956). This derivation of the San Juan Redware tradition from the Mogollon culture (Breternitz, 1980) is difficult to support given the available evidence. Redware production lags behind
the gray and whiteware production in the Mesa Verde region. Inspection of the redware ceramics reveals that, compared to the fully oxidized Mogollon wares, firing of the San Juan Redwares followed a reduction to neutral firing process followed by a final phase of oxidation which allows for the surfaces to oxidize and provide the characteristic red to orange color. It is thus suggested that an adaptation of the reduction firing techniques of the Anasazi was followed rather than the adoption of the oxidation regime followed by Mogollon potters. Mechanical bonding of the paint of Abajo Red-on-orange is common and may indicate experimentation with a newly developed firing technology.

Several additional points can be brought into the argument supporting the local development of the San Juan Redwares. Brew (1946, p. 254) defined a variant of Abajo Red-on-orange in his work on Alkali Ridge. Abajo Black-on-gray, also recorded in Site 5MT4644 in the D.A.P., is a non-oxidized Abajo Red-on-orange and can be interpreted as the results of experimentation with the oxidation firing that produced Abajo Red-on-orange. Mogollon tradewares are rare in the Mesa Verde region and those sites with Mogollon Brownware, in the Navajo Reservoir District (Eddy, 1961) and Mancos Canyon (Hallisy, 1974; W. J. Robinson, personal communication), date prior to A.D. 500. Thus the major influence from the Mogollon apparently occurred at least 200 years prior to the development of the redwares. Mogollon sherds have been recorded in Basketmaker III and Pueblo I sites in the D.A.P. but they are consistently smudged; no comparably smudged types of local manufacture have been documented.

Tallahogan Red (Daifuku, 1961) of the Kayenta culture was being traded into the Mesa Verde region at approximately the same period as the production of redware. It is suggested that the appearance of the tradeware may have provided impetus for the local development of a redware tradition. However, it appears that San Juan Redware can be accounted for as an indigenous development from a grayware tradition.
MANUFACTURING CENTERS

Difficulty in pinpointing the locality of redware production within the Mesa Verde region is complicated by the unwritten assumption that redware production was concurrent throughout the area. Investigation of the redware present in the D.A.P. indicates that Abajo Red-on-orange may be interpreted as representing an inter-regional trade ware. Refiring tests indicate that red-burning clays from the Brushy Basin Formation were being selected for redware production, whereas buff-burning clays from Upper Cretaceous formations were used for graywares and whitewares. Availability of red clays is apparently concentrated in the Blanding-Bluff areas of Utah. The San Juan Redwares consistently exhibit a finely crushed rock temper that, allowing for the differences induced by oxidation firing, is difficult to distinguish from the crushed rock temper in whitewares of the same period. Those tempers are produced from cobbles derived from igneous deposits and appear to define a manufacturing locale adjacent to riverine cobbles resources. Redwares occur throughout the region, including those areas without ready access to cobbles, in which were utilized sand or sandstone tempers for whitewares and graywares; redwares in those areas indicate their movement by trade systems. The appearance of Abajo Red-on-orange in the Dolores River sites is late (A.D. 750) and local red clays are of generally poor quality for ceramic production. Conversely, cobble temper is available along the southerly drainages of the Abajo Mountains and the lower San Juan River, and this westerly source for the importation of redwares is postulated.

Bluff Black-on-red presents another problem as two varieties of crushed rock have been documented by the inventory analysis of the D.A.P. San Juan crushed rock temper, thought to indicate ceramic production activities along the San Juan River, is found in some sherds of Bluff Black-on-red and may indicate the spread of redware production to other areas of the Mesa Verde region. Local redware production may have occurred along the Dolores and Mancos Rivers; the lack of sand or sandstone tempering agents in the redwares suggests that major portions of the Mesa Verde region were not directly
involved in its production and obtained it by trade. Discussion of the spatial distribution of Deadmans Black-on-red production is hampered by a lack of familiarity with its distribution across the region, but its limited variation in stylistic and technological attribute expressions possibly indicates a restricted production that may have been centered somewhere along the western stretches of the San Juan River.

CONSIDERATIONS

Deadmans Black-on-red production appears to cease at approximately A.D. 950; it is not superceded by other locally produced redwares but instead represents the termination of redware production. Oxidized trade-wares from the Kayenta area are found beginning approximately A.D. 1000, but the disappearance of the indigenous redware tradition remains a vexing problem for interpretation. It is apparent that the ware represents a Mesa Verde Anasazi product. The types exhibit a developmental sequence similar to that of the whitewares; initially crude types undergo design elaboration and technological improvements. Slipping and the use of crushed sherd for temper appear at approximately A.D. 900.

There are significant differences between the whitewares and redwares. Design elements and formats of the redwares do not closely correspond with those of their companion whitewares. Excluding the ubiquitous round-bottom bowl shape, redware vessels show a number of unique shapes, especially the short beakers of Bluff Black-on-red. Seed jars comprise a large portion of the shapes represented in the D.A.P. excavations.

Why were redwares produced? There is no utility redware manufactured in the Mesa Verde region; graywares apparently satisfied storage and cooking requirements. Do redwares represent a ceramic with special uses? They are not strictly associated with ceremonial or mortuary activities; redware seed jars are commonly recovered from Basketmaker III and Pueblo I pithouses. There does appear to be a slight tendency for redware sherds to be used as tools. Pondering of the subject suggests that if the ware
were a trade commodity for most of the Mesa Verde region, it would be valuable (in terms of energy expended to obtain a vessel) and that curation of the broken vessel fragments may have occurred due to that ascribed value.

CONCLUDING REMARKS

No pat answers to the question are being advanced. In looking back to the work of Erik Reed concerning the status of San Juan Redwares in the Mesa Verde region, it appears that we have failed to take up the guidon and make significant progress in understanding the place of redware ceramics in the interpretation of the Anasazi occupation of the region. Certainly, the lack of attempts at defining the scope of the problem and the methods for resolution of these questions has significantly influenced our lack of knowledge. Erik Reed was apparently correct in saying that early redwares in the Mesa Verde region are indigenous, but that they originated in the western portion of the region and those redwares found in the eastern portion of the Mesa Verde region probably came from the Blanding-Montezuma Creek area.

The impetus for the local redware tradition appears to be from the Kayenta (via Tallahogan Red) rather than from a direct Mogollon source.

This paper has not provided the answers, but it does represent an attempt to place the current knowledge into a model which may allow for development of specific questions and of the methods to resolve them. Dismissal of the model may be necessary in the light of further data, but until such investigations occur, the preceding interpretation best explains the current situation in regard to San Juan Redware in the Mesa Verde region.

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THE PALISADE RUIN (LA 3505):
A Coalition Period Pueblo near Abiquiu Dam,
New Mexico
STEWART PECKHAM

INTRODUCTION

In April and May 1958, an archaeological salvage excavation was conducted at LA 3505, a 14th century Rio Grande Anasazi ruin near the site of the then proposed Abiquiu Dam on the Rio Chama in Rio Arriba County, New Mexico. The site had been destined for partial or complete destruction since it lay within a proposed borrow pit. Ultimately, however, the borrow pit was not used, and the partially excavated site has remained untouched ever since, but has recently been considered for further excavation or partial development for recreation (Klager, 1980).

At the invitation of the National Park Service, U.S. Department of the Interior, the Museum of New Mexico, in partnership with the School of American Research, carried out the salvage excavation under Memorandum of Agreement #14-10-333-295. Available funds were limited, and only part of the site could be uncovered. This paper is the second revision of the original report prepared by the writer in compliance with the above-mentioned agreement (Peckham, 1959; 1974).

Excavation was done by the writer and a crew of four laborers from the nearby town of Abiquiu. Much assistance was provided by the U.S. Corps of Engineers through its Resident Engineer, Donald Wilson, and his staff, particularly Claude W. Matthews and W. Eaton. The Horner Mid-Valley Construction Company, the prime contractor for the dam, made available a front-end loader for moving back dirt from around the kiva. Charlie R. Steen, then Regional Archaeologist, National Park Service, Southwest Region, through his advice and physical assistance during and after the excavations did much to ensure the success of the project. The late Stanley A. Stubbs, of
the Laboratory of Anthropology, Museum of New Mexico, lent his broad familiarity with Rio Grande archaeology and his expertise in pottery classification.

THE AREA

LA 3505 is situated on a high, flat-topped mesa about 400 meters north of the narrow, 120 meter deep canyon through which flows the Rio Chama. Its UTM location, Zone 13, 372140 Easting, 4011760 Northing, lies within the old Piedra Lumbre Grant (Fig. 1). Riana Ruin (Hibben, 1937), prior to the construction of Abiquiu Dam, was situated on the opposite side of the Rio Chama on a lower bluff at the confluence of the Chama and Cañones Creek, 1300 meters west-northwest of LA 3505. AR-4 (LA 25293), a major site in an important complex of 17th century Navajo sites (Schaafsma, 1979) lies 1800 meters north of LA 3505.

At an elevation of about 1970 meters above mean sea level, the trees in the area are predominately pinyon and juniper which grow along the slopes of the mesas and some nearby rincons. In the immediate vicinity of LA 3505, an open prairie of mixed grasses and cacti prevails.

The approximately 20-year weather record accumulated at Abiquiu Dam since the excavation of LA 3505 shows a mean temperature range of -3°C in January to 22°C in July, with extreme temperatures of -32°C and +37°C on record. The average date of last frost is May 13, though the earliest recorded last frost was on April 7 and the latest on June 27. Average first frost date in the fall is October 13, but first frost has occurred as early as September 10 and as late as November 1. The period of frost-free temperatures averages 153 days. Mean annual precipitation is 239 cm., though extremes of 126 cm. and 331 cm. have been recorded. As is common in the Southwest, precipitation is least from November to May or June, and approximately two-thirds of the annual accumulation falls as rain during July through October.
THE SITE

In its original state, LA 3505 consisted of a U-shaped block of 45 to 50 cours ed adobe or sandstone masonry surface rooms, one story high, on
the north, west, and south sides of a spacious rectangular plaza. On the east, and otherwise open, side of the plaza was a palisade (hence the name of the site) 41 meters long constructed of pinyon and juniper poles. Within the plaza, only two architectural features were exposed by the limited excavations: a circular, subterranean kiva and a small, semi-subterranean mealing room (Fig. 2). A mass of fire-cracked rock lay a few meters east of a gap in the palisade near its mid-point. Outside the northeast corner of the plaza was a short, right-angled alignment of cobbles that may have been a single cobble-outlined garden plot, such as occur in profusion along the higher areas bordering the lower Chama drainage, or it may have been an eastward extension of the north wing of the house block.

Surface Rooms

In all cases, the surface rooms were rectangular and, with a few exceptions, oriented so that the long axis of each room paralleled the long axis of the room block. The principal exceptions were features 7 and 22 whose long axes were at right angles to the north-south, long axis of the west room block. Portions of these two rooms extended westward about 1 meter beyond the westernmost walls of the other rooms of the room block (Fig. 2). Whatever was the preconceived plan of the builders of the settlement, the symmetry was lost with the later construction of seemingly randomly placed rooms on the plaza side of each segment of the U-shaped room block.

Twenty-two of the 25 surface rooms excavated were constructed of coursed adobe with the lowest course having been laid in a shallow trench dug into sterile soil or on top of a footing of a single row of cobblestones. Occasionally, large, flat boulders or sandstone slabs were set upright to give greater stability to the adobe base course. Broad, shallow depressions paralleled the outer walls of the room block, indicating that adobe for construction was dug from areas as close to the room block as possible. Curiously, but possibly because it came from a deeper or
Figure 2. Plan of the Palisade Ruin (LA 3505), showing features excavated and tree-ring dated features.
different deposit, adobe used to build the few inner rooms of the west room block has withstood weathering better than that used for the first rooms built. In most cases, it was possible to observe bonding and abutting of the lowest course of adobe, but no higher courses remained. Some, but not all, interior walls of rooms were plastered with a thin wash of adobe. Room corners generally were rounded as were junctures of walls and floors. Floors were only lightly plastered, if at all.

Features 9, 10, and 12 were constructed of coursed sandstone masonry, using long narrow slabs, some measuring as much as 76 cm. long, 20 to 30 cm. wide, and 2 to 4 cm. thick. The tabular slabs probably were obtained from the lower member of the Chinle Formation which crops out along the exposed slopes of the mesa. Most slabs show some bi-directional chipping of the edges. Although some of this shaping may have been done at the quarry, numerous sandstone spalls in the fill and outside the rooms attest to final shaping taking place where the stones were to be used. Whether due to weathering or to the lack of adhesiveness on masonry, no plastering was preserved on the masonry walls.

With walls standing only 30 to 40 cm. high, evidence of exterior doors was lacking, and only between features 22 and 23 was there a door connecting two rooms. Although no ladder sockets were noted in surface rooms, it is inferred that roof entry may have prevailed. This is suggested by the occurrence of substantial amounts of refuse outside the west wall of the room block—presumably an accumulation resulting from dumping from the roof.

In spite of the uniformity of plan of the pueblo as a whole, room size was quite variable, with the smallest room (feature 3) having only 2.48 m$^2$. of floor space, and the largest (feature 15) had 8.53 m$^2$. The latter room was one of four appended to the plaza side of the west room block, and additional rooms apparently were attached to the north and south room blocks as indicated by rubble concentrations in those areas. Excluding feature 3 and the larger, inner rooms, average floor space at LA 3505 was 4.07 m$^2$.; that of the larger rooms was 6.97 m$^2$. 

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Although the larger rooms may have been domiciliary, it cannot be said that the smaller rooms functioned only as store rooms. Floor features were present in only three rooms: single, shallow basin hearths in features 13 and 15 and a mealing bin in feature 18. Fires may have been built directly on room floors, but the fire that destroyed the pueblo left numerous burned areas on floors, precluding certain recognition of such simple hearths. Near absence of interior hearths may indicate that heating of rooms was not required and that the occupation of the site was largely during warmer seasons.

If the smaller rooms were used for storage, their contents were removed before the pueblo was destroyed. Few of the rooms contained more than potsherds and lithic artifacts. An exception, feature 16, contained fragments of both coiled and twilled basketry, knotted yucca fiber, and knotted corn husks, all preserved by charring.

Mealing Room (Fig. 3, lower)

In the plaza, 2 m. east of features 18 and 20, was a small, shallow, semi-subterranean mealing room (feature 27). Rounded rectangular in shape, its long axis ran in a general northeast-southwest direction in contrast to the north-south axis of the surface room block nearby. Charred remnants of vertical posts were found at irregular intervals around the perimeter of the room, presumably to support a jacal superstructure. Present on the floor were fragments of shaped pine planks probably used in roof construction.

Palisade

Before excavation, the east side of the pueblo showed no clearly definable structural remains. However, extending northward from the east end of the south room block was an irregular alignment of two clusters of cobblestones (Fig. 2). Initial trenching between the northernmost of these clusters and the northeast corner of the plaza revealed several rotted upright posts. Expansion of the excavation exposed an alignment of 250 pinyon and juniper posts spanning the otherwise open side of the
Figure 3. LA 3505: subterranean features.
plaza, passing directly through the above-mentioned cobblestone clusters. As if to afford some greater protection or stability, the south end of the alignment turned eastward along the north side of a partially excavated room at the eastern end of the south room block.

The palisade had occasional gaps along its length, but none could be positively identified as a gateway. The cobblestone clusters may have reinforced the palisade where a gate might have passed through it, but they could have simply strengthened a weak point in the palisade. A gap near the center of the palisade may also have been a gateway. Two or three meters east of this gap was a large, low mass of fire-cracked rock and cobblestones such as might have accumulated as a result of repeated depositions at a convenient point just outside the palisade gate.

The original height of the palisade must be conjectural, but its apparent defensive function would have demanded a height of 2.0 to 2.5 m. The posts had been placed in a trench about 30 cm. deep and were held in place with adobe. One would assume that the upper portions of the posts would have been strengthened by being tied together.

Refuse Areas

There was no single refuse deposit at LA 3505. Greatest concentrations were found against the outside west wall along almost the entire length of the west room block. Other accumulations were found east of features 6, 7, 8, and 9, and in features 2, 4, and 27. Typologically late painted and culinary potsherds were found in quantity in and adjacent to the features in the southwest corner of the plaza, suggesting a possible temporary re-use of the site later in the 14th century.

As specialized refuse, the fire-cracked rock and burned cobblestones in feature 27 and east of the center part of the palisade deserve mention. Such materials in such quantities are generally not recorded as being associated with Anasazi habitation sites.
POTTERY

Probably no group of painted ceramics in the Rio Grande region has provoked more consternation among archaeologists than the pre-Biscuit carbon painted types. Descriptions of Santa Fe Black-on-white (B/W), Wiyo B/W, and Galisteo B/W (Mera, 1935) originally were based on site survey collections in the general Santa Fe area, and each type seemed to be individually homogeneous. Excavations, such as at Pindi (Stubbs and Stallings, 1953) showed greater variability with the recognition of Pindi B/W and Poge B/W, in addition to the other three types mentioned above. Amsden (1931, pp. 22-23), at Pecos, also encountered problems in working with the black-on-whites. In the Cochiti District, Honea (1968, pp. 111-169) also encountered a confusing array of black-on-white pottery, much of which did not seem to correspond to the types described by Mera. Still other attributes in carbon-paint pottery have been observed in Tijeras Canyon, east of Albuquerque. At Riana Ruin, 1.3 km. southwest of LA 3505, Hibben (1937) found carbon paint pottery similar to that at LA 3505, but more like the later Biscuit Ware and lacking Santa Fe B/W.

It is clear that, although the carbon paint pottery studied by the above investigators is probably of the same general period, there are numerous regional variations that appear to have some typological validity but with attributes that are generally imperfectly compared and contrasted. This writer is likewise confronted with the need to verbalize the painted pottery at LA 3505, and that has led to some compromising of the descriptive system that is more honored in the breach than in the observance.

Almost 80 per cent of the painted pottery at LA 3505 corresponds to what the late Stanley A. Stubbs referred to as the "Valley" and "Pajarito" varieties of the early 14th century type, Wiyo Black-on-white (Amsden, 1931, pp. 24-25; Mera, 1935, pp. 16-17). Although the term "variety" may be imprecise typologically, it does serve to distinguish two reasonably divergent ceramic developments in the northern Rio Grande region whose derivations, areal extents, and significances remain to be satisfactorily explained.
The "Valley Variety" conforms to the type as described by Amsden and reiterated by Mera: tan, brownish-gray, to almost olive drab surface color; soft paste; gritty feel; high polish on its decorated surface and rough or faintly striated on its undecorated surface; rather thick vessel walls (range 5.2 to 7.7 mm.; average 6.2 mm.); generally unslipped or occasionally with a "self-slip" or float resulting from polishing; carbon paint decoration; and a decorative style made up predominately of broad lines and bold solids. Particularly distinctive is the apparent hairline separation of framing line and filler in solid designs. The term "Valley Variety" refers to the common distribution of this combination of attributes along the northern Rio Grande Valley and areas east of it along the western and southern flanks of the Sangre de Cristo Mountains. The Valley Variety occurred in small amounts in various parts of LA 3505, but primarily in rooms in the southwest corner and features 14 and 17 (Fig. 4i).

The "Pajarito Variety" is more frequently found along the Rio Chama and on the Pajarito Plateau and occurs commonly throughout LA 3505 (Fig. 4j). It lacks the brownish color and softer paste of the Valley Variety and, instead, is grayer and harder but not nearly as much as its apparent predecessor, Santa Fe B/W. Like the latter type, the Pajarito Variety may be less well polished and, while showing increased use of broad lines and solids in its carbon paint decoration, it continues the frequent use of elements filled with hatching, though not quite as commonly as does Santa Fe B/W. The Pajarito Variety, being thinner and harder than the Valley Variety, produces a "clink" when sherds of it are struck together. This contrasts with the Valley Variety which makes a "clunk" or dull sound when two sherds of it are struck together. Subjective as this criterion may be, it often serves to confirm the distinctions in the visual criteria.

Also present at LA 3505 were small amounts of Santa Fe B/W and Pindi B/W, each tending to be most frequent in a different portion of the site (Fig. 4g and 4h). The latter, with fairly large fragments of pumice in
its temper has the Santa Fe area and the southern tip of the Sangre de Cristo Mountains as its area of manufacture.

The remaining painted pottery at LA 3505 consisted of sherds of a thick, soft, chalky gray type with crude Wiyo Style designs in a black to brownish carbon paint and resembling what might be assumed to be a transition from Wiyo B/W to Abiquiu Black-on-gray (Biscuit A). Sherds of this Wiyo/Abiquiu transition were confined almost entirely to two rooms (features 2 and 4) and the adjacent refuse areas (features 29 and 33) in the southwest corner of the pueblo (Fig. 4k). It is possible that these typologically late potsherds were deposited at the same time as the Micaceous Corrugated described below. They may also correspond to the Wiyo/Biscuit transition cited by Hibben (1937) as being the predominant painted pottery at nearby Riana Ruin.

Except for a fragment of a dipper handle (Santa Fe B/W) and three small jar sherds of the same type, all painted pottery at LA 3505 came from bowl forms.

Culinary pottery predominated in virtually every feature excavated, and while corresponding in many ways to the types Tesuque Smeared-indented and Cundiyo Micaceous-indented (Mera, 1935, p. 18), they seem more variable in the amount and location of coil obliteration and the type of temper used. Some had no smearing of coils at all, but the great majority were smeared to some degree. Thus, the presence or absence of this surface treatment was the principal criterion used in classification (Figs. 4a and 4b). In some instances, it appears that basal portions of vessels (all culinary pottery occurred in jar forms only) had total obliteration of coils, calling for recognition of a Plain Gray category (Fig. 4c).

The late Coalition or early Classic period utility pottery of the Chama Valley, Cundiyo Micaceous-indented (here listed as Micaceous Corrugated), was found in the refuse area (feature 29) in the southwest corner of the plaza (Fig. 4d) and nowhere else and presumably post-dates the construction and primary occupation of the site. It is possible that these sherds were from a vessel or vessels left by later people taking shelter
beside the still-standing walls of the vacant pueblo. Pottery of this type
predominated at Riana Ruin, almost directly across the Rio Chama from LA 3505,
and people from that settlement may have made occasional use of the Palisade
Ruin.

OTHER ARTIFACTS

The array of stone artifacts at LA 3505 presents little that might be
considered diagnostic of the period. The two slab metates recovered were
made of the massive basalt that occurs in abundance on the south side of
the Chama, and the manos for these metates were all of the tabular sandstone
also used in the construction of features 9, 10, and 12. Grinding stones are
collectively tabulated in Figure 41.

Hammerstones (Fig. 4m) of river cobbles or pebbles are common,
occurring in greatest numbers on the kiva (feature 28) floor and in lesser
numbers in features 17 and 18 and in the southwest corner rooms. In the
latter two areas, they may have been used for sharpening grinding stones.

One of the most distinctive artifacts at LA 3505 was the notched,
double-bitted axe or tzit-wi. Supposedly used in warfare, none of the
eight specimens included in the tabulation (Fig. 4n) showed evidence of
any use that would cause dulling of the edges. A tiny notched axe, barely
80 mm. long, was made from a pebble of sillimanite, or fibrolite, showing
little finishing except for the ground and polished bit. Other chopping
tools were made from bifacially chipped river cobbles or Pedernal chert.

Of seven pottery polishing stones, six occurred in a cluster of
features (15, 16, 30, and 31), suggesting that much painted pottery was
made by an occupant of the mid-section of the west room block. The remaining
polishing stone came from feature 1. A sample of gray pottery clay also
came from feature 1.

Two pigments (one hematite and one limonite), a paint-grinding slab,
and a tuff mortar possibly used for grinding pigments were widely dispersed.

Cores and utilized flakes of Pedernal chert showed only slight tendency
to cluster in any group of rooms (Fig. 4p). More formal chipped stone
artifacts, knives, hollow-edge scrapers, drills, and projectile points (Fig. 4q), when combined with cores and flakes, show some clustering in three loci in the southern three-quarters of the west room block. Five of the six projectile points recovered came from presumed outdoor work areas (features 29, 30, and 31); one came from feature 2.

Feature 16 yielded a number of charred fragments of a coiled basket with a two-rod and bundle foundation and a non-interlocking stitch encircling the foundation and part of the bundle below. The basket had slightly over 2 coils per cm. and 4 to 5 stitches per cm. A basket of similar coil and stitch numbers left its impression on the exterior of a Wiyo/Biscuit B/W deep, flat-bottomed bowl found in feature 1. Also from feature 16 were charred fragments of a coarsely woven twilled ring basket with a basic over-one-under-one weave. One fragment shows a possible over-two-under-one-over two weave. The osier ring has a two-rod foundation bound together with a wrap-stitch.

Other perishable artifacts include six pieces of knotted corn husk and three pieces of knotted yucca fiber, all coming from feature 16. Pieces of shaped Ponderosa pine planks were recovered from features 13, 27, and 28. Those from the floor of the kiva (feature 28) were very fragmentary, but projected lines between fragments indicated that the planks measured up to 152 cm. long, 15 to 18 cm. wide, and 2.0 to 2.5 cm. thick.

UNWORKED BONE

No worked bone artifacts were recovered from LA 3505, but unworked bone came from 10 features (Fig. 4r). Six bone specimens were from deer, including two bones that were burned and one that had been split for marrow. Other bones, presumably from local fauna, included antelope, jackrabbit, turkey, and bobcat, the latter coming from the floor of the kiva (feature 28). Of particular interest, from feature 9, was a bone identified as follows:
"Bovidae
Bison bison (?) Immature (calf)
Bos (?) Sex (?)
Small
Left cornus process with portion of left frontal, fragmentary, charred." (Personal communication, Thomas W. Mathews, Southwest Archeological Center, March 1, 1960).

Although it is possible that the specimen is Bos (domestic cattle), Mathews felt that the attributes observable were more likely those of *Bison bison*.

**DATING**

Wood and charcoal specimens were dated by the Laboratory of Tree-Ring Research, University of Arizona, and were as follows:

<table>
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<th>Provenience</th>
<th>Species</th>
<th>Inside</th>
<th>Outside</th>
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<tr>
<td>Feature 1, fill (Room 21)*</td>
<td>Pnn</td>
<td>1172</td>
<td>1310vv</td>
</tr>
<tr>
<td>Feature 2, floor (Room 22)</td>
<td>Pnn</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Feature 9, floor (Room 5)</td>
<td>Pnn</td>
<td>1276p</td>
<td>1312B</td>
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<td>Feature 13, floor (Room 6)</td>
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<td>-</td>
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<td>Pnn</td>
<td>1238p</td>
<td>1314r</td>
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<td>1179p</td>
<td>1310vv</td>
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<td>-</td>
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<td>Feature 28, floor (Kiva)</td>
<td>Pnn</td>
<td>1237p</td>
<td>1313vv</td>
</tr>
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<td>-</td>
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<tr>
<td>Feature 35 (Palisade)</td>
<td>Pnn</td>
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<td>1310vv</td>
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<tr>
<td>Feature 35 (Palisade)</td>
<td>Pnn</td>
<td>1129</td>
<td>1256+vv</td>
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</table>

Pnn = Pinyon PP = Ponderosa Pine Jun = Juniper

*Note--excavation "Room" numbers were changed to "Feature" numbers for convenience of discussion.*

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From the cluster of dates, the Laboratory of Tree-Ring Research infers that the construction of LA 3505 took place between A.D. 1312 and 1314 (Robinson and Warren, 1971, p. 34).

**DISCUSSION**

**Earliest Anasazi Settlement in the Lower Chama Valley**

In A.D. 1312, LA 3505 was literally a frontier outpost at the extreme northwestern periphery of Anasazi settlement in the Rio Grande region. Two other settlements, Riana Ruin, LA 290 (Hibben, 1937), briefly occupied in A.D. 1335, and Tsiping, LA 301, south of the Palisade Ruin on Cañones Creek, established about A.D. 1315 and probably lasting until at least the mid-14th century, were slightly more remote settlements but probably not significantly so. Many other Anasazi villages existed along the more fertile bottomlands that begin about 3 km. downstream from the site of Abiquiu Dam, and it is likely that many of them pre-dated LA 3505. Just how much earlier they were established is uncertain, since none have been dated by dendrochronology.

One site, Ku, LA 253 (Figs. 1 and 5), on the Rio del Oso, has yielded the only Developmental Period pottery (one sherd of Kwahe'e B/W) found in the lower Chama Valley, suggesting that the site might have a component as early as the 12th century. However, the sherd may have been from an heirloom vessel owned by a Coalition or Classic Period occupant of the site, or the sherd may have been picked up from one of many Developmental sites in the general Española area only 10 km. away.

Almost all sites along the lower Chama are associated with both Santa Fe B/W and Wiyo B/W, and it is possible that controlled collections from such sites might permit seriation and a better opportunity to date the sites at least relatively. Thus far, ceramic cross-dating on the basis of tree-ring dated intrusives offers little help for sites of the Coalition Period. Wingate Black-on-red (B/R), from the general Zuni area in west-central New Mexico, was manufactured from about A.D. 1050 to 1200 (Carlson, 1971, pp. 15-17). It is found widely on late Developmental sites with Kwahe'e B/W and
Figure 5. Ceramic Associations with Documented Coalition and Classic Period Sites in the Chama Valley.

<table>
<thead>
<tr>
<th>Site name</th>
<th>LA No. (Ref. Fig. 1)</th>
<th>Kwako B/W</th>
<th>Santa Fe B/W</th>
<th>Wiyo B/W</th>
<th>Abiquiu B/C</th>
<th>Bandelier B/G</th>
<th>Sankawi B/C</th>
<th>Polsoni Incised</th>
<th>Rio Grande Glaze (Intrusive)</th>
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on early to middle Coalition sites with Santa Fe B/W. Wingate B/R seems to have survived in the Rio Grande region well into the 13th century before it was replaced by an even more popular type, St. Johns Polychrome (Poly), which in its native area is dated between A.D. 1175 and 1300 (Ibid., p. 39). No Wingate B/R is recorded on sites in the Chama Valley, and only two sites, Ku (LA 253) and Leaf Water (LA 300) (Leubben, 1953, pp. 30), are known to have St. Johns Poly on them. On these bases, first settlement of the Chama Valley may have been as late as the middle to late 1200s, assuming a considerable time lag for the western red wares to reach the Rio Grande region. This conservative rationale may have guided Wendorf and Reed (1955, pp. 138-143) in their setting the beginning of the Coalition Period at A.D. 1200.

On the other hand, transport of these distinctive pottery types may have been far more rapid than is usually surmised. We have very little understanding of the mechanics of prehistoric Anasazi commerce, and we assume that, because the items were carried by people afoot, decades would have been required to transport them to the Rio Grande region. However, there is hardly a late Developmental or early Coalition site that has not yielded some Wingate B/R, and St. Johns Poly is common on many late Coalition sites. A virtual flood of these pottery types must have reached the Rio Grande region to achieve the saturation observed, and this seems to have been accomplished in spite of the hundreds of potential recipients occupying areas between Zuni and the Rio Grande. Conceivably, it was the attractiveness of a number of Rio Grande resources (obsidian, turquoise, and perhaps more abundant wild game and its by-products) that brought prehistoric Zuni pottery to the Rio Grande region. Judging from its rarity or absence on Zuni sites, Rio Grande pottery was not an exchange item in the trade system.

Thus, these intrusive types may provide bases for inferring earlier beginnings of the Coalition Period, perhaps about A.D. 1150, and early initial settlement of the lower Chama Valley, possibly by about A.D. 1225. The question that remains, however, is why was the Chama Valley vacant prior to the Coalition Period? Perhaps one of the most likely reasons was that
the Developmental Period population in much of the Rio Grande region was so small and dispersed that there was no pressure to expand into unpopulated areas. Although site survey data is far from complete for many areas of the northern Rio Grande region, and urban growth may have obliterated many prehistoric sites, the few localities that have had intensive coverage show the presence of far fewer Developmental communities than one finds for the same time range in western Anasazi areas. Not until the arrival of migrants from the west, perhaps as early as A.D. 1150, in the Pajarito Plateau and upland areas around the western and southern flanks of the Sangre de Cristo Mountains, is there evidence of population increase that might have induced either the original inhabitants of the area or the arriving migrants to choose to move into the hitherto vacant land in the Chama Valley.

With little or no previous utilization of the vegetational resources of the Chama Valley, it is likely that many valley bottom localities were occupied by thickets of vegetation that would have posed land clearing problems for the fewer and smaller groups of Developmental Period people who might have been tempted to move into the area. Whether from choice or necessity, Coalition Period sites were fairly widely separated along the Chama and its tributaries (Fig. 1). Competition for land and water would not have been a major concern for the first settlers of the area, but by the Classic Period, the populations were obviously large enough to make use of intervening lands along the lowland parts of the valley and to expand their operations into dry-farming of the thousands of garden plots that occupy higher river terraces and mesa tops bordering the major streams. The establishment of LA 3505, far above the bottomlands of the Chama, may be indicative of the need, even during the Coalition Period, for people to develop previously marginal lands for agriculture.

The modern precipitation record for the Abiquiu Dam area suggests that the area is rarely blessed with truly adequate rainfall to support agriculture, and tree-ring growth indices (Dean and Robinson, 1977; 1978) appear to show that conditions were generally no different during the
Coalition Period. The tree-ring indices appear to show that moisture conditions were compatible with the establishment of LA 3505 about A.D. 1312 and that moisture was severely deficient in A.D. 1315, perhaps sufficiently to induce the inhabitants to move to a new location having the potential for providing more reliable moisture conditions for farming—such as might have been found at Tsiping, apparently established about A.D. 1315, near present-day Cañones. Of course, we are looking at this in retrospect, whereas the Anasazi family was living it day-by-day, probably unaware of changes in the mean annual rainfall and standard deviations from the mean, but certainly responsive to current conditions that would affect what is usually vaguely referred to as its "subsistence strategy."

For the most part, tree growth, as represented by the tree-ring indices, all but ceases by mid-summer, just about at the time when summer rains begin to hasten crop growth and maturity. Thus, a drought reflected in tree-rings might not have been severe or long-lasting enough to affect adversely crops which rely more on shallow moisture from rainfall. Tree-ring indices, pollen profiles, and other ecological indicators may provide much useful data, but archaeologists are cautioned not to use them uncritically, since none of them tell the whole story—and not necessarily the true story.

LA 3505—The Plan

Reed (1956, pp. 11-17), in one of his characteristically and admirably terse syntheses of prehistoric Southwestern culture, points out distinctions between early, mainly western, and late, primarily, Rio Grande settlements in terms of orientation of the surface room block, i.e., the direction toward which the long axis of the room block faces. Early sites ordinarily are oriented toward a point on the compass, usually in the southeast quadrant. Late sites commonly face inward from three or four sides in what Reed calls the "hollow square or plaza" type.

Palisade Ruin, and neighboring Riana Ruin, being short-lived settlements, retain the simplicity of ground plan not ordinarily discernible in many
large pueblos in the lower Chama Valley where long occupation and almost explosive population growth obscured the ground plans of their founding settlements. Both Palisade and Riana show some semblance of the "directional" orientation of earlier sites, but the use of a palisade or wall delimits the plazas, giving the settlements a degree of "completeness" they otherwise would have lacked.

The forming of this enclosure in the course of a year or two certainly points to the likelihood that the Indians were building according to a plan that even dictated the $90^\circ$ rotation and symmetrical placement of features 7 and 22 at LA 3505.

Anasazi concern for how their village would look and function was probably due to several factors, of which one of the more obvious would have been how large a group of people would have lived there. In previous years and in areas such as the San Juan Basin where terrain was more or less level and less confining, if communities existed, they were more likely to be clusters of "directionally-oriented" single- or extended family dwelling units, each reasonably separated from its neighbors and suggesting a degree of independence on the part of its occupants. In the Chama Valley, and many other parts of the Rio Grande region, arroyos, volcanic intrusives, and irregular erosional remnants of the Santa Fe Formation may often have tended to limit the size and layout of desirable settlement sites. Emerging from the traumatic events that led the Anasazi to abandon the San Juan Basin and other localities, the people may have found the Rio Grande region requiring that they become more interdependent as topographic limitations thrust families together spatially, architecturally, and socially. Earlier examples of this can be seen at Chaco Canyon where the great villages show varying degrees of consistency of plan and the coalescing of large populations--and short-lived success. In the Chuska Valley, where Chacoan social control was largely absent or minimal, there were huge communities of dozens of individual house blocks, each with one or more kivas, stretching for half a kilometer along a ridge or in disjointed clusters occupying 2 or 3 km$^2$. 

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Thus, to some extent, the growth of the plaza-oriented settlements in the Rio Grande region may have been the result of the need to economize in the use of limited space and perhaps to obviate the need to build on arable land. An example of what might have happened without the plaza-type village plan can be cited at the great Classic Period pueblo of Sapawe (LA 306) on El Rito Creek, 25 km. east of LA 3505. Sapawe is comprised of about two dozen massive room blocks surrounding seven plazas and occupies about 70,000 m². Room blocks were normally bisected lengthwise, with pairs of dwelling units facing onto separate plazas. Simply arranging these room blocks into a single line would produce a settlement 3.6 km. long! Communication would have been exceedingly difficult, and any integrative functions of the coalescence of the hundreds of families would have been negated. Plaza orientation, on the other hand, would have facilitated administrative and social control, emphasizing the plaza as a work area and communal ceremonial focus. At LA 3505, dwelling units were arranged laterally, at first, paralleling the long axis of the room block. By the early Classic Period, villages downstream and elsewhere often had "suites" of rooms arranged so that only one room fronted on the plaza, and two or three storage rooms were placed behind, rather than beside, it. Presumably occupied by a family unit, this placement of a suite would have permitted more families to occupy a single, but more massive, room block.

Defense would certainly have been a consideration in the development of the plaza-oriented settlement. Population along the lower Chama and elsewhere had been increasing steadily, and competition for land, water, and other resources probably was developing. Warfare, whether with neighboring Anasazi or raiding Plains Indians seems to have been an Anasazi preoccupation, as evidenced in rock art, oral history, and the Historic Period survival of formal warrior societies that probably had their beginnings in the Coalition or Classic periods.

At LA 3505, the placement of features 7 and 22 so that they projected outward from the west wide of the pueblo would have provided positions for
enfilading or raking fire (bow and arrow, of course) from the roof-top down onto whoever or whatever tried to invade the pueblo from that quarter. Similar strategic vantage points would have been provided by the eastward extension of the south room block, permitting a view of the outside of the palisade.

Although we usually think of the term "defense" as protection from human intrusion or attack, it is conceivable that the palisade at LA 3505 was built to defend against non-humans--animals. Although modern urban growth has driven much wildlife from our cities, rural areas are still pestered by hungry predacious animals, attracted by domestic animals, accumulating refuse, or even curiosity. Even though LA 3505 may have been occupied by 60 or so humans, it was still in a rural and probably very wild area where carnivorous and non-carnivorous animals might boldly enter the settlement for whatever edibles might be there. That not all such animals escaped is suggested by the bobcat mandible found on the kiva floor, though that may have had a ritual function.

Thus, a palisade on the east side of the plaza at LA 3505 may have served to keep out marauding carnivores, very much like so-called "coyote fences" of pinyon and juniper poles cut to varying lengths that kept unwelcome animals away from northern New Mexico dwellings and farmyards, and which survive today as decorative barriers in urban localities.

Pit Rooms--An Emerging Rio Grande Pattern

Several decades ago, syntheses of Anasazi archaeology cited the irreversible transition from pit houses to surface dwellings and the conversion of pit houses to kivas. Since the 1950s, that interpretation has been shown to be somewhat simplistic as more and more Pueblo III, and even Pueblo IV, pit rooms are reported from many parts of the northern Southwest.

An early candidate for a Pueblo III pit house was at the Olguin Site, near Belen (Ferdon and Reed, 1947), which may have been associated with Santa Fe B/W. Leubben (1953) reported Coalition pit houses at Leaf Water (LA 300), about 28 km. down the Chama from LA 3505. Clearly pre-dating
the adobe-walled surface rooms at the site, the structures measured 3.1 m. or less in greatest diameter, averaged 1.7 m. deep, and had a floor area of about 6.6 m². The rooms had at least one hearth; two had ventilators; three had wall niches; and one had a bank of three mealing bins. Leubben identified those with ventilators as kivas (1953, pp. 20-21), though they contained little else that would distinguish them from those he called pit houses.

Other similar structures have been found in the Galisteo Basin (Dutton, 1964), in and near Santa Fe (Stubbs and Stallings, 1953; Allen, 1973), near Cochiti Pueblo (Lange, 1968), and in the vicinities of Albuquerque and Bernalillo. At some of these sites, and at LA 3505, some pit rooms appear to have served as temporary or seasonal dwellings, perhaps used while more permanent surface dwellings were being constructed. This certainly is suggested at Leaf Water, where four of the structures were found in three widely separated locations. Although feature 27 was the only one found at LA 3505, more extensive testing of the plaza area might uncover additional ones used by builders of other surface dwelling units.

By its function as a mealing room, feature 27 has counterparts both near and far, the mealing room (Pit House 1) at Leaf Water (Luebben, 1953, pp. 21-24) being the closest. But, these two examples are, so far, unique in the Rio Grande region, and Kidder (1958, pp. 137-141) comments at length on the curious near absence of mealing bins in any kind of a room in the region.

West of the Rio Grande, Pueblo III Anasazi pit rooms have a discontinuous distribution, and include LA 2569, near the Río Puerco, west of Los Lunas (Fenenga and Cummings, 1956, pp. 248-250); LA 3559, near San Mateo (Museum of New Mexico Archaeological Site Files); Mariana Mesa sites, near Quemado (McGimsey, 1980); and in the Navajo Mountain and Black Mesa districts of northeastern Arizona and adjacent parts of Utah (Ambler and others, 1964; Lindsay and others, 1968; Gumerman and others, 1972; and Ward, 1976). The structures at the latter locations are intriguing in that many are mealing
rooms that are consistently located near the northerly part of each site. The similarity of the placement of feature 27 at LA 3505 to the Arizona and Utah examples cannot be disregarded, though with the possibility of additional pit rooms occurring at LA 3505, this similarity may be fortuitous.

LA 3505--Dwelling Units

As creatures of convention and habit, people tend to behave according to convenience and within the range of behavior accepted by those with whom they interact. Thus, archaeological materials may sometimes be shown to occur in reasonably consistent proveniences that circumscribe areas of repeated activity, whether that activity be a specific kind of work or of a more general nature possibly reflecting territoriality.

At the Palisade Ruin, distributions of individual or grouped classes of cultural materials show a tendency to cluster around foci that may be inferred to be dwelling units of separate groups of people, presumably families. Since the site was not totally excavated, some of the patterns observed, especially near the northern and southern ends of the west room block, may be incomplete. Rather than tabulate all artifactual occurrences, frequencies of some artifact types or groups of types have been plotted on a schematic plan of LA 3505 so that the contents of features having high artifact frequencies can be compared and contrasted with those having lower frequencies or no artifacts at all (Figs. 4a-4r).

Although they seem to be showing some clustering, the pottery type frequencies may be deceptive, since some high sherd counts include numerous sherds of the same shattered vessel, sometimes occurring in the same feature, sometimes in adjacent features, and sometimes in widely separated features. Ultimately, however, it is not actual frequencies that seem to be significant, but rather the number of different artifact and non-artifact categories occurring in each feature (Fig. 6a). From these, it is possible to derive some measure of the variety or intensity of activities that took place in each feature or group of features, as well as pointing out
those features that saw only limited use (Fig. 6b). Using this approach, at least five "suites" of rooms can be recognized: Suite #1 (features 1-7); Suite #2 (features 8-12); Suite #3 (features 13-16); Suite #4 (features 17-20); and Suite #5 (features 21-24). It is assumed that the outdoor work and activity areas for the individual suites were those immediately adjacent to the suites, though it is likely that some space was shared.

Suite #1 is considerably larger than the others, and it is possible that some of its rooms, features 1, 2, and 4, for instance, may belong to a suite that extends eastward from feature 1.
Feature 20, though one of the large rooms appended to the plaza side of the west room block, appeared to have been in a state of collapse even before the pueblo was abandoned. Useless as a habitation, it may have been replaced by feature 18, but it saw only slight use as a refuse dump thereafter.

Grinding stones were not common at LA 3505, but their greatest frequency was in features 18 and 27, suggesting that the former room may have been constructed by the same family that built feature 27. In such a case, at least one of the metates from the dismantled mealing bins in feature 27 may have been installed in the new bin in feature 18.

Unexplained is the absence of grinding tools in features 11 and 15. In view of the fairly high frequency of projectile points, chipped stone debris, and other formal artifacts in and around feature 11, it is possible that the occupants of that feature were more skilled in stone-working and hunting. Assuming that these two skills were more frequently performed by men, it is conceivable that only men used feature 11, thus accounting for the absence of grinding tools normally used by women.

With perhaps as many as five additional large rooms added to the plaza side of the north and south room blocks, there may have been as many as ten suites of rooms at LA 3505. Apportioning numbers of individuals to numbers of rooms is somewhat arbitrary. What are normally thought of as storage rooms--the smaller rooms in each suite--may also have been used as sleeping rooms, with most daytime activities being carried on outdoors. With four or five persons per family, the population may have been between 50 to 60 people.

CONCLUSION

In view of the brevity of its occupation, we can think of LA 3505 as representing only an instant in the long-term process that, 50 years later, was to convert the Chama Valley, and the general Tewa area, into one of the major prehistoric population centers in the Southwest comprised of a dynamic system no less spectacular than the florescence of Chaco Canyon in the 11th and 12th centuries.
Twenty-three years after LA 3505 was abandoned, a new, but smaller, settlement was established on the opposite side of the Rio Chama--ultimately to be named the Riana Ruin. Apparently conditions for a sustained occupation did not prevail, and Riana seems to have been abandoned within a year or so. However, Tshiping, near Cañones, remained a viable, populous community well into the last half of the 14th century, when it was vacated, and the northwestern frontier of the Chama Valley and Tewa area retreated to settlements closer to the Classic Period pueblo of Abechiu which underlies the modern community of Abiquiu.

For the people of LA 3505, their efforts to establish a frontier settlement appear to have been part of an adaptive strategy that failed, but at the same time, they were gaining knowledge about these parts of the Chama Valley and learning that the area around present-day Abiquiu Dam could not be relied upon to support the burgeoning population that was filling the valley downstream.

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THE MICACEOUS POTTERY OF THE RIO GRANDE

A. H. WARREN

INTRODUCTION

The micaceous pottery of the Rio Grande has been the subject of dis­
cussion and speculation among Southwestern archaeologists and historians
for more than a century. The time span of micaceous vessels in the Southwest
extends from circa A.D. 200 at Snaketown, Arizona, to the modern day pottery
of Taos and Picuris pueblos in the northern Rio Grande.

Any vessel which exhibits visible flakes of mica on its surfaces has
generally been referred to as mica ware. Various techniques of manufacture
have been recognized and described, but many questions concerning the
micaceous pottery remain unanswered. In this paper, previous work relating
to this pottery in the Rio Grande region will be reviewed and some of the
problems relating to technology, cultural affiliation, and origins will
be discussed.

TECHNOLOGY OF MICACEOUS POTTERY

At least three main varieties occur in the Southwest: (1) one which
has a mica slip or wash applied to the surface of the vessel before firing;
(2) another which has been made from residual clays containing abundant
mica flakes; and (3) a third which is tempered with mica schist or any
other rock containing mica. There is no evidence at this time that the
three technologies represent a single ceramic tradition either functionally
or aesthetically. Both scrape and paddle-and-anvil thinning techniques
have been suggested for these mica wares, while mold construction has been
inferred for vessels produced with residual micaceous clays.

There may be a technological difference between those produced with
residual clays and those which have been tempered with rock containing
mica according to Shepard (1963, p. 162). Pots made from residual clays
such as those found in the Precambrian rocks of the northern Rio Grande may
be untempered. As Shepard observes, a residual clay formed from the alteration of mica schist or granite may contain numerous flakes of mica and grains of quartz, and it may then be necessary to remove the coarse grains before the clay can be used.

The application of a micaceous slip, on the other hand, leaves little doubt that the potter intended to produce a micaceous ware. Mica slips have been found on utility pots, plain polished, and plain incised vessels in the upper and middle Rio Grande regions.

Evidence of coil construction may be found in the imperfect welding of coils or the oblique arrangement of particles of clay in the cross-section of a sherd. Weld marks of molded vessels may be more difficult to recognize unless a large portion of the pot can be examined. Two piece molding, both vertical and horizontal, have been described by Foster (1948) among Mexican potters. Weld-marks from molding have not been reported among the mica wares of northern New Mexico, however.

Paddle and anvil technique is a thinning process and may occur with either coil or mold construction. Distinguishing characteristics are shallow rounded depressions on the vessel interior from anvil marks (Shepard, 1963, p. 185). Vessels made with residual micaceous clays may have a laminar arrangement of the mica flakes which has been considered evidence of the paddle and anvil technique, although other finishing methods could produce similar fabric.

A mica slip may be difficult to distinguish from a micaceous surface produced by floating or smoothing the vessel walls when clay is moist. If mica is not present in the clay body, a mica slip can be assumed.

A finishing technique which has been observed ethnographically is the use of a corncob to wipe the damp surface of the pot, which leaves fine striations (Gunnerson, 1959, p. 8). Striated surfaces occur frequently on vessels tempered with micaceous rock.

CLASSIFICATION OF MICACEOUS POTTERY

Ceramic types with mica of the past 1800 years have been named and
described by archaeologists in the American Southwest. Those which are
ingnigenous to the middle and upper Rio Grande belong to four major time
periods (Table 1). Not all types listed have been formally described;
others may be synonyms. Gila Plain, for instance, is distinguished from
Adamana Brown mainly on the amount of mica in the clay (Haury and Sayles,
1947). These two early types were apparently indigenous to southern Arizona
or east central Arizona, out of which developed other types, but seem to
have had little or no influence on later developments in the Rio Grande.

The first significant appearance of mica wares in the upper Rio Grande
was noted by Mera (1935). By about A.D. 1300, two types, Cordova Micaceous,
with prominent exterior ribbing, and Cundiyo Micaceous, a smeared-indented
utility type associated with Wiyo Black-on-gray, were being produced in
northern Rio Grande (Ibid.). These were followed by Sapawe Micaceous,
a utility type with a "somewhat washboard-like aspect" that was associated
with biscuit wares of the Upper Rio Grande dating between A.D. 1450 and
1600. These three mica ware types were apparently tempered with crushed
rock containing mica.

During the manufacture of glaze-paint wares between A.D. 1400 and
1600 in the middle and upper Rio Grande areas, associated utility wares
were frequently tempered with quartz mica schist. Mera (Ibid.) named, but
did not describe, this utility Rio Grande Micaceous. It also has been
referred to as Blind Indented Corrugated (micaceous).

A micaceous utility type found on sites in Tijeras Canyon, recently
described (Oakes, 1978, unpublished ms.), is associated with decorated
wares dating between A.D. 1200 to 1400. The pottery is tempered with
silvery gray Precambrian micaceous schist and is of local manufacture.

**Potsuwi'i Incised and Potsuwi'i Gray.** Polished grayware decorated
with incised geometric patterns and slipped with mica was made on the
Pajarito Plateau in the northern Rio Grande area. Described by Mera (1932),
Potsuwi'i Incised is tempered with vitric tuff, a volcanic rock which is
abundant in that area. Originally dated between A.D. 1475 or 1500 and about
Table 1. Micaceous pottery types that have been named and described in the Rio Grande region  
(Dates modified after authors' estimates; centers of distribution suggest areas of production)

<table>
<thead>
<tr>
<th>POTTERY TYPE</th>
<th>TIME SPAN (A.D.)</th>
<th>MFG. TECHNOLOGY/SOURCE OF MICA</th>
<th>DISTRIBUTION</th>
<th>NAMED BY</th>
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<td>300 - 1400</td>
<td>Paddle &amp; anvil; crushed mica rock temper</td>
<td>SW New Mexico (as intrusive)</td>
<td>Haury &amp; Sayles 1947</td>
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<td>Paddle &amp; anvil; mica schist temper?</td>
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<td>Smeared indented; micaceous rock temper</td>
<td>Northern Rio Grande</td>
<td>Mera 1935</td>
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<tr>
<td>Sapawe Micaceous</td>
<td>1450 - 1600</td>
<td>Smeared coils; micaceous rock temper</td>
<td>as above</td>
<td>as above</td>
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<td>1450 - 1600</td>
<td>Smeared coils; micaceous rock temper</td>
<td>Middle and Northern Rio Grande</td>
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<tr>
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<td>1450 - 1700?</td>
<td>Smeared indented, nearly obliterated coils; quartz- mica schist temper</td>
<td>Middle and Northern Rio Grande</td>
<td>as above</td>
</tr>
<tr>
<td>Potsuwi'i Micaceous Incised</td>
<td>?1500 - 1600</td>
<td>Polished and incised; mica slipped</td>
<td>Northern Rio Grande</td>
<td>Mera 1932</td>
</tr>
<tr>
<td>Potsuwi'i Gray</td>
<td>as above</td>
<td>Polished; mica slipped</td>
<td>as above</td>
<td>Harlow 1973</td>
</tr>
<tr>
<td>Blind Indented &amp; Plain Micaceous</td>
<td>?1600 - 1700</td>
<td>Coils nearly obliterated; mica slipped</td>
<td>Middle Rio Grande</td>
<td>Warren 1967</td>
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<tr>
<td>Table 1, continued</td>
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<tr>
<td>Faint Striated utility</td>
<td>1600 - 1700</td>
<td>Surfaces finely striated; thin walls; micaceous rock temper</td>
<td>Middle Rio Grande</td>
<td>Kidder 1936</td>
</tr>
<tr>
<td>Perdido Plain</td>
<td>As above</td>
<td>As above</td>
<td>NE New Mexico</td>
<td>Gunnerson &amp; Gunnerson 1971</td>
</tr>
<tr>
<td>Ocate Micaceous</td>
<td>1550 or 1600 to 1750</td>
<td>Paddle &amp; anvil?; thin laminar walls; micaceous rock or micaceous clay?</td>
<td>NE New Mexico</td>
<td>Gunnerson 1969</td>
</tr>
<tr>
<td>Taos Micaceous</td>
<td>?1550 - present</td>
<td>Thin laminar walls; micaceous clay</td>
<td>Taos Pueblo</td>
<td>Ellis &amp; Brody 1964</td>
</tr>
<tr>
<td>Vadito Micaceous</td>
<td>1600 - present</td>
<td>Walls 5 - 12 mm.; mica slipped</td>
<td>Picuris Pueblo</td>
<td>Dick 1965</td>
</tr>
<tr>
<td>Peñasco Micaceous</td>
<td>as above</td>
<td>Walls 3 - 7 mm.; micaceous clay</td>
<td>As above</td>
<td>As above</td>
</tr>
<tr>
<td>Manzano Micaceous</td>
<td>?1630 - 1900</td>
<td>Walls 3 - 4 mm.; laminar fabric; micaceous rock temper</td>
<td>Spanish American villages</td>
<td>Hurt &amp; Dick 1946</td>
</tr>
<tr>
<td>Cimarron Micaceous</td>
<td>?1750 - 1900?</td>
<td>Walls 4 - 6 mm.; laminar fabric; micaceous rock temper or mica slip or float?</td>
<td>NE New Mexico</td>
<td>Gunnerson 1969</td>
</tr>
<tr>
<td>Petaca Micaceous</td>
<td>1800 - 1895</td>
<td>Surface scraped; walls 4 - 5.5 mm.; micaceous clay</td>
<td>Northern Rio Grande, Spanish</td>
<td>Dick 1968</td>
</tr>
<tr>
<td>El Rito Micaceous</td>
<td>1800 - 1895?</td>
<td>Surface scraped; walls 5 - 8 mm. &quot;sand&quot; temper, mica slipped</td>
<td>As above</td>
<td>As above</td>
</tr>
<tr>
<td>Navajo Micaceous</td>
<td>1800 - present</td>
<td>Surface finely striated; walls 4 - 5.5 mm.; micaceous rock temper</td>
<td>Salado Creek to Socorro area</td>
<td>Brugge 1963</td>
</tr>
</tbody>
</table>
1600, the type was common as intrusive pottery at Pecos Pueblo, where it was associated with pottery dating between A.D. 1500 and 1600 (Kidder, 1936). Both jars and bowls of Potsuwi'i Incised have been found. A ware contemporary with Potsuwi'i Incised is Potsuwi'i Gray, which has a well polished surface frequently slipped with mica (Harlow, 1973, pp. 39-40).

Mica Wares of the Spanish Colonial Period. During the 17th century, following the settlement of the Rio Grande by Spanish colonists, smoothed, plain utility wares, with or without mica slips, were being produced in numerous localities in central and northern New Mexico. At Las Majadas (LA 591) and Cochiti Spring (LA 34), two Spanish homesteads in the northern Santo Domingo Basin, many of the culinary wares are slipped with mica. Mica slipped vessels of this period are generally thin-walled, ranging between 3.5 mm. to 5.5 mm., and tempered with crushed rock. Exterior surfaces may be striated, while interiors of jars are often polished and smudged. Nearly obliterated coils may occur. The micaceous slips consist of gold or silver mica flakes up to 2 mm. in diameter.

Similar mica slipped vessels found at Spanish villages in Northern New Mexico have been named El Rito Micaceous by Dick (1936). However, these date to the 19th century in that area.

Striated Utility Wares of the 17th Century. Kidder (1936) described Faint Striated utility ware at Pecos Pueblo, but similar pottery has been found in the Rio Grande Valley, in eastern New Mexico, and in the Rio Puerco Valley. Thin walls, 3 to 5 mm., are characteristic. Faint striations and minute flecks of mica appear on the exterior surfaces of jars. Fine-grained, micaceous sandstones, generally used for temper, varied in composition from one area to another.

A thin-walled, gray utility ware from sites on the open plains of eastern New Mexico has been attributed to the Faraon Apaches (Gunnerson and Gunnerson, 1971, p. 9). Named Perdido Plain after an extensive tipi ring site near Las Vegas, New Mexico, the Gunnersons noted its similarity to Faint Striated utility at Pecos. At the type site, Perdido Plain is
associated with Ocate Micaceous, a mica ware made by the Jicarilla Apache potters prior to A.D. 1750.

Pottery meeting the definition of Faint Striated or Perdido Plain wares was the predominant utility type at a group of 17th century Spanish smelter sites near Golden, New Mexico (Warren and Weber, 1979). Associated pottery at the smelters includes late 17th century glaze wares from Pueblo villages in the Santo Domingo Basin.

Resemblances between the plain striated mica ware at the Cochiti Spring site (LA 34) and 17th century Faint Striated utility at Pecos were discussed by Kenneth Honea (n.d., unpublished manuscript, Museum of New Mexico files). Similarities between the Pecos and Las Majadas wares have also been noted (Warren, 1967).

The Micaceous Pottery of the Jicarilla Apaches, 17th and early 18th Centuries. Ocate Micaceous, commonly found on late 17th and early 18th century Jicarilla village sites in northeastern New Mexico, is described as having prominent vertical to diagonal striations and a micaceous float or pseudo-slip on exterior surfaces of jars (Gunnerson, 1969). Walls are thin, averaging 3 to 4 mm. The vessel body has a laminated fabric suggesting paddle-and-anvil thinning and is tempered with abundant mica and angular quartz fragments. Ocate Micaceous is frequently associated with late 17th and early 18th century Pueblo pottery, including Pecos Polychrome and Tewa Polychrome. Sherds of Ocate Micaceous have been found in the Cochiti area, at San Antonio Pueblo (LA 24), north of Tijeras, and rarely on Navajo and Pueblito sites in northern New Mexico.

An abundance of thin-walled (4 to 5 mm.) micaceous pottery made in the same technological tradition as Ocate Micaceous, was found at a historic site on Cañones Creek east of Cerro Pedernal. Associated pottery included polished black, plain red, and red-on-buff sherds. The mica ware contains flakes of silver and gold mica and angular grains of quartz mica schist. The plain and red-on-buff sherds are tempered with fine-grained sandstone. One sherd of Kapo Black with vitric tuff temper was noted. Vessel forms of the polished plain wares include small hemispherical bowls, jars, and one
flange plate ("soup plate") rim. The red-on-buff sherds are in the tradition of Casitas Red-on-brown, a historic Spanish pottery type (Dick, 1968).

Mica Wares of the 19th Century. Some of the early historic period mica ware traditions persisted through the 19th century and into the present in some areas, but in general the later historic mica wares tend to have thicker walls, ranging between 5 to 8 mm. or more. Micaceous clays were used by Pueblo and Jicarilla Apache potters in the middle and upper Rio Grande Valley and in northeastern New Mexico. To the west, the Navajo potters of the central Rio Puerco drainage made thin-walled striated pottery tempered with crushed micaceous rock (Brugge 1963).

Manzano Micaceous, a late historic period mica ware, was named for the pottery at the Spanish village of Manzano (Hurt and Dick, 1946). Manzano Micaceous is thin-walled, 3 to 4 mm., with laminar structure and crushed mica granite temper. Possible production dates range between A.D. 1630 to 1900 or later. Hurt and Dick (Ibid.) identified pottery from the Tijeras Arroyo Rancho site and two abandoned Spanish American mission sites in the Chama and El Rito valleys as belonging to the Manzano mica ware. Later, Dick (1968) described two additional micaceous types in El Rito Valley, Petaca Micaceous and El Rito Micaceous, dating between A.D. 1800 and 1895(?).

El Rito Micaceous is defined as having sand temper and walls ranging between 5 and 8 mm. (Ibid., p. 84):

... exterior surface slipped with white or golden sericite mica. Inside jars and bowls smoothed by polishing stone to semi-luster...

At present only two known areas contain this type of micaceous slip pottery: Picuris-Taos and El Rito.

Mica slipped vessels similar to El Rito Micaceous Slip have been since found at Spanish sites in the Canada de Cochiti and in White Rock Canyon (Warren, 1974; 1978). The temper is coarse-grained volcanic sandstone from the Cochiti area. Estimated dates of manufacture range from around A.D. 1750 to 1900 or later. At Pueblo del Encierro (LA 70), across the Rio Grande from Cochiti Pueblo, the mica slipped utility wares...
were coil constructed, wide mouthed jars with slightly flaring rims. The surfaces are moderately to well smoothed and all have been slipped with flakes of iridescent, crenulated, silvery to light gold colored mica flakes. Over one half contained coarse volcanic sandstone temper. The clay body of these did not contain any mica. Another group contained vitric tuff temper with black or brown pumice shards. Miscellaneous temper types included quartzite, quartz mica schist, granite gneiss(?) and a sandstone with red feldspar grains. In all varieties, it was obvious that a mica slip was applied to the outside surface.

Taos Micaceous continued to be made at Taos Pueblo with little change in technology throughout the 19th century to the present (Ellis and Brody, 1964). At Picuris Pueblo, Vadito and Peñasco Micaceous as described by Dick (1965) persisted with little change and are still being produced by potters today.

By A.D. 1750, the Jicarilla Apaches in northeastern New Mexico were producing a mica slipped ware described and named Cimarron Micaceous by Gunnerson (1969, p. 33):

The paste has a flaky, laminated appearance with layers parallel to the surface. Temper consists of moderate amounts of medium sized pieces of mica and angular pieces of quartz and other minerals. The surface is usually covered with a fine textured clay slip or floated layer. Occasionally sherds have a somewhat metallic appearance where the slip or float is rich in sericite or very finely divided mica.

Historically, the Jicarillas were noted for the excellence of their pottery made for cooking pots:

In 1852 John Greiner, then acting superintendent of Indian Affairs in New Mexico, reported that nearly a hundred Jicarillas under Chief Chacon intended to 'settle down and manufacture tenajos.' (Gunnerson, 1974, p. 156).

The tenajos, or cooking vessels, were used to trade for corn and wheat. Micaceous vessels similar to Cimarron Micaceous have been found at the 19th century Spanish village of Aurupa on Técolote Creek, northeastern New Mexico (Warren, n.d.), constituting 57 percent of sherds examined: All of the micaceous culinary sherds appear to have been of local origin. As fragments of possible temper were present at the site. Three pieces of gold colored mica schist with quartz...
and dark minerals were found. The mica wares from Aurupa are similar to Cimarron Micaceous but have no slip or float and have no thickening of rims. Polished red and black wares also containing fragments of the mica schist were found at Aurupa.

The micaceous ware described by Brugge (1963, p. 9) in the Navajo Country is post-1800:

... Similar to Navajo Utility, but with a moderate amount of mica in the paste and visible on the surface. Many of the mica particles are large enough to be identified without the aid of a lens. There is far less mica than in Taos, Picuris, and Jicarilla pottery ...

The micaceous variety of Navajo Utility occurs on sites "from Mesa Gigante north to Salado Creek."

**DISCUSSION AND CONCLUSION**

During the past decades numerous archaeologists and historians have discussed the origins and diffusion of the mica wares of the Rio Grande, referring mainly to historic and ethnographic records. Particular attention has been paid to the mica wares of the 18th and 19th centuries. These include at least two different techniques of manufacture: the application of a mica slip on the exterior of utility jars and the use of a residual micaceous clay.

Brugge (1979, p. 103) in an article relating to early 18th century Spanish-Apachean relations remarked:

The early years of the 18th century, when many refugees were among the Apachean tribes, are of particular importance for an understanding of their cultural development. The Pueblo people brought with them many new ideas and skills, some of Indian origin and others of European derivation.

Historic and archaeological research of Apaches in northern New Mexico has provided considerable evidence of interaction between the Apaches and the pueblos of Pecos, Taos, and Picuris, beginning possibly as early as the mid-1500s (Gunnerson, 1969; Gunnerson, 1974; Gunnerson and Gunnerson, 1971; Hayes, 1974).

Opportunities for translocation of cultural tradition and technology among the Pueblos and the Apaches are well documented. Speculations concern-
ing the origins of historic micaceous wares are divided between those who believe the Jicarilla Apaches obtained the technology from the Pueblos, and those who believe the reverse. Ellis and Brody (1964) concluded that since the Taos made micaceous pottery during Pueblo IV times, the Jicarilla learned to make micaceous pottery from the Pueblos. Wedel (1959) was of the opinion that the micaceous pottery of the Dismal River sites was "almost certainly to have been directly stimulated, if not actually imported, from the Southwest," since mica wares occurred in such low percentages on the Plains. Gunnerson and Gunnerson (1971) concurred with this conclusion, but cautioned "at the moment it is not clear to us whether the earliest form of Jicarilla pottery, called Ocate Micaceous, is derived directly from Taos Micaceous, or whether the differences ... are innovations introduced by foothills Apache..."

A third viewpoint has been suggested by this author (Warren, 1977) that some of the ceramic traditions of mica wares may have been introduced into the Southwest by Mexican Indians who came north with Spanish colonists. Hurt and Dick (1946, p. 310) postulated that the technology of Manzano wares of the Spanish American settlements in New Mexico may have been introduced by the Spanish missionaries from Mexico, or by the Mexican Indians who came with them. They contended that the Manzano wares, excepting the mica pottery, did not resemble either the prehistoric or present day Pueblo or Navajo Indian pottery and therefore constituted an independent tradition. They cited numerous localities in Mexico where similar wares were produced, but did not suggest any source for the micaceous wares of Manzano.

MacNeish (1970) has since described the mica wares of the Valley of Mexico from the period between 400 B.C. to post-A.D. 1500. Interaction of Mexican Indians and the American Southwest have been recorded as early as A.D. 1540, when 1,300 (maximum reported) Indians, most of them presumably from Central and Western Mexico, accompanied the Coronado expedition into the Southwest in 1540-41 (Riley, 1974, p. 28). Of these, several Indians remained at Zuni, while others stayed at Pecos.
Throughout the 17th century there were numerous reports of Christian Indians fleeing to the Apaches, and following the Spanish reconquest of New Mexico in the 1690s:

... through the grants of settlement tracts, many Tlaxcalan families were encouraged to emigrate from Mexico in the early 18th century to serve as troops and agents with the Apachean groups ... (Abbink and Stein, 1977, p. 157).

Cultural influence of Navajo and Plains Apaches upon the Spanish-American village of Manzano, New Mexico, was discussed in detail by Hurt (1939, p. 253), who also recognized the possibility of mutual exchange of cultures:

... Probably as many of the people of Manzano were taken captive by the Indians as the Indians in turn were captured by the Manzaneños.

Pottery making was among the technologies included in the mutual cultural exchange discussed by Hurt.

Questions relating to the origins of the mica wares of the Rio Grande remained unanswered. Continued investigations of archaeological and historic nature are needed to clarify many of the questions concerning these wares. Particular attention needs to be given to the nature and description of the attributes of mica wares in order to differentiate culturally determined factors from environmental influences. The nature of an attribute may determine its role in development or diffusion of ceramic tradition and provide some guidelines for resolving problems relating to culture history.

If attributes that can be related specifically to local geologic resources are eliminated as being environmentally determined, a number of pottery types listed in Table 1 could be grouped on the basis of similar ceramic technology. Such separations are tentative and are based mainly upon published data, which may be incomplete. The following groups should be reviewed and revised as indicated by added information in the future:

(1) Gila Plain and Adamana Brown are contemporary in part and appear to be geographic variations of one ceramic tradition.
The three 14th century northern Rio Grande Micaceous types may be culturally as well as geographically related by surface treatment and by micaceous paste. These all have textured coil finish.

Rio Grande Micaceous is associated with the Rio Grande glaze wares. The mica may be a geographic attribute, for many of the contemporary utility wares are identical in technology except for the mica inclusions.

Potsui'i Incised and Potsui'i Gray are short-lived 16th century types with polished surfaces and mica slips. These are the only non-utilitarian types considered herein. The two seem to be closely related in source area, form, construction and finish, and in time, but have no known antecedents or descendants. Although not well dated, the types appear to phase out before A.D. 1600.

Blind Indented Micaceous pottery as considered here has a mica slip and dates to the 1600s. The pottery was found at the Las Majadas site (LA 591) and nearby Cochiti Springs (LA 34), both 17th century Spanish homesteads. The ware was common but not abundant. Post-1700 mica slipped vessels are generally thicker-walled, but all may be in the same technological tradition (Group 8 below).

Faint Striated utility vessels with mica, Perdido Plain, and Navajo Micaceous have in common thin walls (less than 5 mm., usually 4 mm.), smoothed and finely striated exterior surfaces, and fine-grained temper with sparse to moderate mica. These wares have been found in diverse context at the Perdido Site in northeastern New Mexico, at Pecos, in east central New Mexico in the Santa Rosa area, at a 17th century Spanish smelter site in the San Pedro Mountains, and in the eastern Navajo Country as Navajo Micaceous. These are "look-alikes" as far as manufacture is concerned; possibly non-micaceous wares should be added to the group. Who made these vessels is not known, but for now Apaches are likely candidates.

Thin-walled vessels produced from residual micaceous clays include Ocate, Taos, Vadito, Peñasco, Petaca, and Manzano(?) micaceous types, and range in time from circa A.D. 1550 to present. No agreement has been reached concerning the origin, diffusion, or the possible interrelations among these
types. No clear-cut attributes separate one named type from another at this point in time.

The probability that mica was an intentional ceramic tradition and not merely a geographic expedience in this group is suggested by the discovery of prepared micaceous clay specimens some distance from clay deposits, and by the importation of mica schist to sites for possible use in preparation of micaceous clays. These wares have been noted for their refractory qualities which make them excellent cooking vessels.

(8) The last group, having the attributes of El Rito Micaceous, are large, thick-walled jars with "sand" or sandstone temper and mica slips. This group includes Vadito Micaceous vessels from Picuris Pueblo and mica slipped jars found at 18th and 19th century Spanish sites in the Cana da de Cochiti and White Rock Canyon.

Archaeological studies of historic pottery in the Rio Grande are spotty, particularly during the Spanish Colonial period. Measured dates are generally absent and chronological placements have been based upon cross-correlations, seriation, and guesswork. Thus far, very little of the research that has been done has been published.

Variation of the ceramic assemblages from one site to another is marked. Classification and chronological patterns and controls that are present in the prehistoric and 17th century Puebloan sites are lacking in the post-1700 assemblages of Pueblo, Apache, or Spanish American affiliation. Because of the diversity of ceramic assemblages from one site to the next, a widespread and systematic study of the historic pottery of the three cultures may be needed before specific questions concerning the mica pottery can be answered.

Albuquerque, New Mexico

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For more than a quarter of a century, anthropologists concerned with the archaeology of northwestern Arizona south of the Grand Canyon have not all been in agreement as to the relationships, if any, between the prehistoric Cohonina and the historic Havasupai. Erik Reed, writing more than thirty years ago, even questioned the distinctness of the Cohonina (Reed, 1948, p. 259). I am sure if he were writing about the Cohonina today, he would be aware of the sizeable body of data, albeit by no means sufficient, that we can now bring to bear; the distinctness of the Cohonina from, say, Kayenta Anasazi or Cerbat traditions is well documented.

Schwartz (1955; 1956a), basing his position on excavations conducted within a short distance of Supai Village in Havasu Canyon, has maintained that the Cohonina were directly ancestral to the Havasupai. He has postulated seven periods of culture-history for these prehistoric people, referring to them as Cohonina throughout the first five periods until "near 1600 A.D.," then to the "Cohonina-Havasupai" in Period VI, and finally to the Havasupai alone after 1880.

His first three periods, to A.D. 1100, present no difficulties, and are based primarily upon the work of others (e.g., Colton, 1945; McGregor, 1951). Between A.D. 900-1100, Schwartz's "Period III - Climax," he (Schwartz, 1956a, p. 79) indicated that "all the available land on the plateau was now being used" although neither in his paper nor in his earlier and longer study (1955) did he present evidence in support of this statement. He postulated, however, that at this time "the canyons of the . . . Colorado River . . . were first used by the Cohonina" on a permanent basis,

*This is a revised version of a paper presented at the annual meeting of The Society for American Archaeology, Vancouver, B.C., 1979.
Schwartz terms his Period IV, from A.D. 1100 to 1300, one of defense, and stated that the Cerbat, a foreign people, came to live with the Cohonina in Havasu Canyon, swelling the population "many fold." Furthermore, peoples of the Kayenta Anasazi and Prescott traditions, as well as the remainder of the plateau dwelling Cohonina moved to Havasu Canyon, according to Schwartz.

In Period IV, one of tranquility in his view, there were "three hundred peaceful years" for the Cohonina, ending "near 1600 A.D., with the first gentle impacts" of European culture.

In another paper published in the same year, entitled "Demographic Changes in the Early Periods of Cohonina Prehistory," Schwartz (1956b) analyzed surface sherd collections from 104 sites in the Cohonina area, and from this postulated several hypotheses relative to the prehistoric Cohonina occupation there. First of all, he noted, as had other workers before him, that after A.D. 1100 there was a rapid decline of habitation on the plateau. In fact, Schwartz (1956b, p. 29) remarked: "Then, after approximately 1200, the culture of the Cohonina Branch is lost to the prehistorian."

He then suggested a number of hypotheses to explain this disappearance. He rejected one which would have the Cohonina migrate from their territory on the grounds that no evidence of them has been found elsewhere, and said: "Therefore, it seems reasonable to assume, on the basis of present evidence at least, that the Cohonina did not leave their homeland after A.D. 1100" (p. 30). He also rejected a hypothesis that the Cohonina were decimated by disease on the grounds that they did not live in "apartment-like structures." Thirdly, he raised the possibility of "enemy peoples" exerting pressure on the Cohonina at that time and referred to Shoshoneans and Athabascans. Finally, he suggested that the Cohonina remained in their area, by inference solely in Havasu Canyon, or "to a place that has yet to be investigated archaeologically, . . . the Grand Canyon and its side canyons."

Shortly thereafter, in 1958, the ethnobotanist Alfred Whiting (1958), in a paper entitled "Havasupai Characteristics in the Cohonina," tended to echo Schwartz's position and hypothesized that the Havasupai represent "a
blend of invading Walapai-like peoples from the west with the remains of an 'indigenous' Cohonina culture."

My own position (Euler, 1958; 1975), based upon both excavation and extensive survey throughout Grand Canyon, has the Cohonina living on the plateau south of Grand Canyon, and on the adjacent Esplanade and Havasu Canyon, from about A.D. 700 to 1150 and then disappearing from the cultural record. Some years ago I postulated that the bearers of the more westerly Cerbat tradition began an easterly expansion over the Grand Wash Cliffs, gradually taking over former Cohonina territory between A.D. 1150 and 1500. In the light of recent field work to be discussed shortly, I would now modify that and indicate that all of the former Cohonina range and indeed all of Grand Canyon was abandoned *circa* A.D. 1150 and was not again occupied by human groups until some time after A.D. 1300. At that time, the Cerbat moved into the void left by the Cohonina and were still living there at the opening of the historic period when the Spaniards described them in terms we now recognize as Havasupai and Walapai.

This general position has now been adopted by most anthropologists working in the area. In an unpublished manuscript, "The Origins of the Havasupai," John Martin (1973) concluded that "Euler's contention that the Havasupai and the Hualapai both derive from the Cerbat seems to be the more plausible hypothesis if only because it fits with the cultural uniformity of the Pai." Dee Green, working in collaboration with me (Euler and Green, 1978), has independently rejected the notion of a Cohonina-Havasupai continuum. Similarly, Tom Cartledge (1979, p. 315), after intensive survey in the Cohonina area, sees no evidence of them post-A.D. 1150. It should be noted, however, that Alan Ferg (1977, p. 114), after excavating Cohonina sites in 1977, while somewhat ambivalent, continues to cling to the notion of a continuum although he provides no reasoning for this belief.

There are three general lines of evidence that lead most of us to the conclusion that there were no relationships between the Cohonina and the Havasupai.

The first of these is stratigraphic excavation. In all stratified sites
occupied over a long period of time in the geographic area under consideration, Cerbat materials are always found in contexts younger than those of the Cohonina, and frequently with sterile layers intervening (Euler, 1958).

Secondly is the fact that diagnostic Havasupai material traits are demonstrably different from those of the Cohonina and are identical to those of the Cerbat. For example, Cohonina ceramics were finished with a paddle-and-anvil, fired in a reducing or sometimes uncontrolled atmosphere usually producing a gray surface, and were occasionally decorated with black paint or frequently covered with a fugitive red wash. Havasupai and Cerbat pottery is brown, finished with paddle-and-anvil, fired in an oxidizing atmosphere, and almost never decorated; Havasupai jars often show wiping striations on the exterior surface.

Cohonina projectile points, while varying in form, are often triangular, unnotched, and flat based. Those of the Havasupai and Cerbat are invariably small, single or double side-notched, and concave based. Cohonina points never conform to the Havasupai type (Fig. 1).

The Cohonina reduced their food on troughed metates with so-called "two hand" manos whereas the Havasupai and Cerbat exclusively used shallow milling stones with oval pecked basins and "one hand" manos which, ethno­graphically, were gripped in two hands. They also used mortars and pestles for the reduction of mesquite beans.

Cohonina architecture consisted of shallow pithouses, surface masonry pueblos, and masonry "forts." The Havasupai favored rock shelters and brush wickiups while rock shelters are well documented for the Cerbat.

Finally, in the matter of disposal of the dead, it is now clear that the Cohonina practiced inhumation; some 10 such burials are now known (Smithwick, 1977). The Cerbat and the Havasupai cremated.

The most recent surveys in the Cohonina-Havasupai territory have provided a third line of evidence to cast doubt upon the earlier suggestions of a cultural continuum between the two groups. It has been noted that we have evidence of the Cohonina only from ca. A.D. 700 to 1150. During this period, they were trading with the Kayenta Anasazi for decorated ceramics;
Figure 1. Top row: Cohonina projectile points.
Bottom two rows: Cerbat and Havasupai projectile points.
All from sites on the Grand Canyon Esplanade

Photo by R. C. Euler
in fact, most of the dating of Cohonina sites is based upon this intrusive pottery: Kana-a B/W, Black Mesa B/W, Sosi B/W, Dogozhi B/W, Deadmans B/R, Tusayan B/R, Moenkopi and Tusayan Corrugated, and a minor amount of Flagstaff B/W. Cohonina sites of this period have been recorded on the plateau (McGregor, 1951; 1967; Cartledge, 1979). Cohonina sites in Havasu Canyon are primarily confined to the A.D. 1050-1150 period (Schwartz, 1955; Euler and Green, 1978). The most recent surveys in Cohonina territory in Grand Canyon have been conducted on the Esplanade, a broad terrace of the sandstone Supai formation, ca. 300 meters below the South Rim around the lower reaches of Havasu Canyon. Here, almost 200 sites have been recorded (Euler, 1976), of which data from 150 have now been analyzed. These indicate six Cohonina sites dating between A.D. 850 and 1050, 64 Cohonina sites utilized between A.D. 1050 and 1150, ten Kayenta Anasazi locales all dating before A.D. 1150, 18 Cerbat sites and four Southern Paiute sites dating post-A.D. 1300; the remainder represent use by Anglo-Americans in the late 19th century.

All the Cohonina sites on the Esplanade contained intrusive Kayenta ceramics of the pre-A.D. 1150 types just described. The Cerbat sites all yielded post-A.D. 1300 intrusive types such as Jeddito B/Y, Sikyatki Polychrome, and Hopi Utility Ware. A re-examination of sherd collections made by Wilder (1944) from Cohonina sites on the Great Thumb, a plateau area immediately south of the Esplanade also revealed no post-1150 Cohonina occupation.

The point is that throughout the range of the Cohonina and the Havasupai there is absolutely no evidence of any human utilization between A.D. 1150 and around A.D. 1300 or slightly thereafter. Surely, if as Schwartz (1956a) maintained, the population increased "many fold" during this time, some evidence would remain.

We know that the Cohonina were trading ceramics from the Kayenta prior to A.D. 1150 and we know that the Cerbat were trading ceramics from the Kayenta after A.D. 1300. If the Cohonina remained in Havasu Canyon and vicinity after A.D. 1150, why did they cease to import Kayenta pottery at that time? And, if the Cohonina became the Havasupai, why did they resume
economic exchange with the Kayenta and their Hopi descendants after A.D. 1300? If the Cohonina had not abandoned the region, it is logical to assume that their close trading and other cultural relations with the Kayenta would have continued during the 150 years between A.D. 1150 and 1300.

Severe drouth conditions beginning about A.D. 1150 and continuing for almost two centuries (Dean and Robinson, 1977) undoubtedly contributed to the total depopulation of the entire Grand Canyon region (Euler, et al., 1979). Once this environmental situation improved, the region was once again occupied, this time by the Cerbat, the direct ancestors of both the Havasupai and the Walapai, and in no way related to the Cohonina.

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EXCAVATION TESTS AT THE PUEBLO
RUINS OF ABO

BERTHA P. DUTTON

This paper is the result of good fortune: primarily the longevity of
the writer and her lengthy affiliation with the Museum of New Mexico.
Despite changing administrations and altered policies, financial struggles,
unending shifts of personnel, and expanding collections, it was possible
after an interval of 36 years to locate without delay the archaeological
materials derived from my excavations at the prehistoric and historic pueblo
of Abó. Associated notes and photographs were in the files.

Since the article is conceived as an expression of homage to Erik Reed,
I should like to say that he has been an associate and friend of mine all
these years. He has provided much archaeological, ethnological, and other
information which I utilize without cessation. I am grateful for this
opportunity to acknowledge my indebtedness to Dr. Reed for his assistance
and enlightenment. I also would like to acknowledge David H. Snow of the
Laboratory of Anthropology for his aid in the identification of many of
the pottery types analyzed and also A. Helene Warren for similar help
relating to locale of origin and comments on matters of geology.

That which follows relates to the first three tests undertaken at Abo
in 1944. The fourth and most extensive test, along with final conclusions,
will be the subject of another paper in this series.

BACKGROUND

Dr. Edgar Lee Hewett, director of the Museum of New Mexico at the time
of this project, had great concern for the early Franciscan missions built in
New Mexico some 150 years earlier than the Jesuit Missions of California.
It was through his efforts mainly that five New Mexico mission sites of
comparable age (Jémez, Pecos, Abó, Quarai, and Gran Quivira) at one time came
to be owned by state agencies and under the custodianship of the Museum of
New Mexico.
Desiring to bring the importance of the great architectural accomplish­ments of the 17th century to the attention of a widening public, Dr. Hewett envisioned the development of a mission-to-mission highway system that would connect the sites and their related structures. He wished to make possible the presentation of Spanish Colonial history and cultural materials and reveal the impacts upon the prehistoric attainments of the Indian peoples who had occupied the settlements for centuries before the Spaniards came. The Indians of these pueblos spoke dialects of the Azteco-Tanoan language stock, including the Tompiro tongue which was spoken at Abó.

Inasmuch as my archaeological projects in Mesoamerican localities had been interrupted by World War II, and as a part of furthering knowledge of the prehistoric occupation of Abó, Dr. Hewett arranged for me to conduct a few tests and excavations there. The prehistory of this region has been covered to some extent by Toulouse (1949), Vivian (1964), and Bandelier (1892), and the history by a number of sources, but in scattered bits throughout the literature. For a brief summary of the latter, see Schroeder (1979).

TEST I

Near the larger of two plazas in the pueblo south of the mission church, a location was selected for the first test as shown in Figure 1. After clearing the surface, a trench eight feet wide was staked out and opened from the old ox road eastward toward the summit of the mound. Within the cleared area, the outline of a wall was visible. At about eight inches depth on the upper part of the mound, another wall was exposed, parallel with the one noted originally. Two walls extending east-west were then delineated; the four formed the outline of a room (Fig. 2).

Fill in the trench consisted of miscellaneous bones of birds and animals, charred corncob fragments, scattered pieces of human remains--sometimes burned; worked stone, bits of minerals, and a small mass of silty caliche, plus an assortment of potsherds intermixed with wind-blown sand and crumbling walls.
Figure 1. LA97 field sketch showing location of test I and Abo Mission.

Figure 2. Looking into northeast corner of Room I-1 to pit which held a Corona Plain jar. Stone-lined firepit after clearing on the left.
Sherds of culinary jars were in greatest abundance, those from the trench numbering 62. They are of a type identified as Corona Plainware, a pottery made of brown paste (Vivian, 1964, p. 102; Toulouse and Stephenson, 1960, p. 23; Mera, 1935, p. 30). The period of its appearance in the Abó region, I am told, may range between A.D. 1225 and 1460. Used for cooking purposes, the brownware grades from brown to gray to deep black. With the sand temper are small flecks of mica. Primarily jars, the vessels are polished on the interior and wiped on the exterior. They are sometimes striated, but usually at Abó they are smoothed (Kidder and Shepard, 1936, p. 316). The jar walls and rims are mostly thin, the latter rounded or beveled. The body to lip distance is commonly ca. 3.5 cm. When found, the culinary sherds frequently occur in shattered clusters, several or many from a single vessel.

Next in quantity in the trench were 13 Glaze F sherds, some imported, others made locally (A.D. 1650-1672--abandonment of Abó). There were three of a type known in the field as Manzano Brickware, or "Las Casitas" (Dick, 1968, p. 80). This is known from Mesilla, New Mexico, along the Rio Grande and its tributaries as far north as La Sauses, Colorado in the San Luis Valley, occurring "in a line in foothill villages east of the mountains paralleling the Rio Grande from Trinidad, Colorado to Manzano, New Mexico." It dates to ca. A.D. 1650.

Appearing sporadically were other sherds, e.g., two Glaze A, one Agua Fria (1315-1425) and one San Clemente (1325-1425); two Glaze D (1490-1515), one E (1515-1600), and two E-F of about 1600-1650 (Warren, 1979, p. 193). Interspersed with these temporally differing representatives, from which examples were numbered for a Guide Sherd Series, there were three Chupadero Black-on-white with painted designs. Chupadero is a long-lived type which lasted for several hundred years, beginning at Abó ca. A.D. 1150. Finally, examples of Tabirá Black-on-white appeared, a type that developed out of Chupadero about A.D. 1650 (Toulouse, 1949, p. 19), and Salinas Redware of the same era; there were two examples of each type.

Both the Chupadero B/W and the Glaze F wares, especially, demonstrate experimentation in the use of new materials, adaptations of forms, and skills
in fashioning the vessels. The Chupadero makers were involved with a change from traditional carbon paint to the use of mineral pigments. The favorite form of the Glaze F bowls became those with a distinct keel, or carina, encircling a vessel between the curved body and the direct rim. The glaze decoration, as Snow has observed, is usually painted on an over-all redware body, the red sometimes of a rather light, clear color, but ranging from a tan to a brown hue. Some pieces, without the keel, are from the Jornada area to the south. A characteristic of Glaze F at Abó is its simple bold decoration, commonly linear. Often, the glaze paint was too viscous, permitting drips, drops, and bubbly or runny motifs.

A noticeable number of sherds had been fashioned into blanks, discs, ornaments, and odd forms. Two from the first level of the trench, cut into rectangular shapes, were made from Salinas Red and Glaze F. A third one from the same level was fashioned from Manzano Brickware, or "Las Casitas." One sherd of Corona Plain had been coarsely chipped into a disc shape and broken.

Room I-1

This fully excavated room with an adobe floor had masonry of poor quality. Large blocks, some 20" long and 8" high, had been placed at the base of the walls and irregular shaped rocks laid over them with a minimum of mortar (Fig. 2). Traces of plaster occurred on the south wall. The interior measured 4'10" E-W and 13'7" N-S. This gave a rough average, for all wall lengths were irregular; they averaged some 10" in width.

A filled doorway, located in the north wall 1'3" from the NE corner, exhibited a threshold two feet wide 1'2" above the floor, covered with plaster. An opening that had been filled in the east wall had a width of 1'4" with the base 1'8" above the floor.

In the NE corner of the room, remains were found of a Corona Plainware jar set below floor level, five inches from the north wall and four from the east wall. The sherds represent a fairly thick-walled (ca. 7 mm.) brown/black vessel with a highly polished interior and smoothed exterior.
and conspicuous micaceous flecks in the paste. The exterior exhibits zig-zag marks as though made with a carpenter's pencil--or galena. The 12" deep cavity in which the jar rested measured 12"x14" (Fig. 2).

Paralleling the west wall was a rectangular firepit (26"x23" and 3.5" deep) containing fine, grayish-white ash, lined on all sides, and floored with tabular stones (Fig. 3). Associated glazes place the pit in the early 14th century. Seven sherds in the adobe mortar of the east wall, six of which fit together and represent a late Glaze D or early E (or perhaps C according to Warren, which suggests a date between 1425 and 1515 for the pottery).

A 1'5" opening in the west wall, 5' north of the SW corner, exhibited adobe plaster on the threshold set about 9" above the floor (Fig. 3). This led to an adjacent room.

Artifacts recovered from the room fill included a worked sherd of Cieneguilla G/P and one of Glaze E, quartzite polishing pebble and a polishing cobblestone of like material, two sandstone discs or tejas (Van Valkenburgh, 1964, p. 133), two selenite ornaments, a blank of the same material, and an obsidian flake showing use fractures. Fifteen sherds were numbered and added to the Guide Series: 3 Corona Plain, 2 Glaze D-E, 1 E, 7 F, 1 Tabirá, and 1 Salinas Redware.

**Room I-2**

The fill of this room was comparable to that of I-1 and masonry was of similar construction. The well-packed floor measured 5'9" N-S by 13'6' E-W, corresponding in level with that of I-1. A soft, oval outline of carbon was observed in the NW corner, and six inches to the south a fragmented red bowl appeared, its topmost part flush with the floor (Fig. 4). The "rim" had been reworked. Tests were made of a substance adhering to some of the sherds by the University of Michigan Ethnobotanical Laboratory which reported "that the material is mineral in nature and suspect that it is chiefly calcium with some sand content . . . but this would have to be confirmed by mineralogical techniques" (Report No. 253, Lab. No. 3500, April 12, 1948).

Returning to the charcoal oval, it outlined an unlined firepit filled
Figure 3. Room I-1 west wall opening into Room I-2.

Figure 4. Looking to north wall of Room I-2 and unlined pit from which carbonized items were recovered.
to the brim with ashes containing four pieces of a small, restorable bowl of brownware apparently lacking only one little segment. The bowl had been coiled, textured and smoothed, but the manipulation marks were prominent, creating a discernable oblique pattern around the vessel. With the bowl was a polishing stone of the kind that appears with heavily striated jars "amid modern painted wares at Pecos" (Kidder and Shepard, 1936, p. 320). Also in the firepit was the pointed end of a bone awl, so friable that the tip broke off in transit and disappeared. Eight small, flat rock chips were at the base of the pit; a few potsherds, some Glaze A with others, probably body pieces, of the same, and one small cluster of culinary sherds; and small bones completed the pit's contents. Everything was carbonized; the bowl was so badly burned that it was impossible to ascertain its type.

Fill in the room yielded three tejas, two relatively heavy hammerstones exhibiting considerable usage, two quartzite polishing pebbles, bi-faced mano of black vesicular basalt, and another of fine-grained sandstone broken at one end, yet measuring 23 cm. in length. A slightly modified sandstone slab burned deep red had been used as a lap stone for abrading small ornaments. About four inches above the floor, a number of small pieces of egg shell, some with egg yolk color evident, were recovered. Associated were very tiny bones, not yet identified. Corona Plainware numbered 10; three pieces of a Glaze F bowl and several Salinas sherds were noted, as was a Glaze E worked disc. A sherd identified as Kapo Grayware was found, dating to ca. A.D. 1600. Other sherds may relate to it; they are rather thick, and have a streaked exterior that is well polished.

Room 1-3
The west wall of 1-3 gave no evidence of an opening, but the south wall extended west another 5'2'', at the base of which a well-compacted floor was found which covered the northern two-thirds of the "room." At a point 10'8'' north of the SE corner, a short adobe wall 6'' thick and 8-9'' high, with plaster on the south side, projected from the east wall for a distance of 2'10'' (Fig. 5).
Figure 5. Room I-2 showing threshold into Room I-3, stub of adobe wall, and cluster of three firepits as exposed.

Figure 6. Test I, looking east across Room I-3 in foreground into Room I-1 against summit of mound.
In the south part of the room, five inches from the east wall, was a rectangular firepit (22" N-S x 19" E-W). All that remained of its stone lining was one on the south side, a segment on the west, and part of a stone base in its southwest corner (Fig. 5). A small oval feature directly to the south, 16" N-S x 14" E-W, was unlined and full of black ash similar to the adjacent firepit. In the black ashes were a few carbonized sherds, small bits of stone, and minute pieces of charcoal.

Abutting on the west edge of the rectangular pit was a smaller (20"x9") rectangular, stone-lined and floored firepit containing three rocks (fire dogs?). Capped with 2.7" of dirt, the contents below were clean, white, fine wood ash and a piece of charcoal. A utilized obsidian chip came to light in the sherd bag, which Warren states came from the Jémez Mountain region. Room fill yielded bits of hematitic siltstone, malachite, and small fragments of corncobs. Another carbonized corncob was recovered in the fourth level in a small trench designated I-a. There were 32 Corona Plain sherds and 2 worked discs of the same type. Glaze F was most common—19 examples were added to the Guide Series; also added were: 1 Glaze D, 1 E, 3 E-F, 1 Tabirá B/W, and 5 Salinas in bowl, jar, and soup plate forms. After I-3 was abandoned and the north and west walls removed, the area was used as a work space for outside cooking and other tasks. Figure 6 provides a view of test trench I looking east with the exposed floor and work area of Room I-3 in the foreground.

TEST II

The second location selected was about 200 feet up a small tributary of the arroyo in Figure 1 at a big drop in the bedrock. An eight foot trench was set into the west bank. Refuse was plentiful near the stream bank, but coarse gravel was encountered at a distance of some 18 feet.

A lens of debris, shaped like a hemispherical bowl and some two feet in extent at its nadir, was cleared out (Fig. 7). Then a subsidiary trench, II-a, was dug to the north, paralleling the small arroyo. Refuse ceased at a distance of six feet.
Figure 7. Test II trench wall exhibiting depositional lenses.
Sherds recovered included many plain, some corrugated pieces, black-on-white types with mineral paint and others with carbon paint designs, precursors of Rio Grande glaze-decorated examples in rare quantity, and glaze-decorated pieces. Culinary ware included Indented Corrugated and Indented Blind Corrugated as well as the brown/black, black, and red sherds similar to material in trench I.

Although the glaze types represented in these trenches range from Glaze A through D, the former was dominant and bowl forms were preferred. One sherd is of the Sanchez form, with beveled lip on an everted rim, a Rio Grande type dating from 1325 to 1425. Another probably is Los Padillas G/P with an interior beveled rim, and may be one of the precursors of Rio Grande glaze-decorated vessels, antedating the recognized Glaze A group. Several others are Cieneguilla G/Y (1325-1425) from the Galisteo Basin, one with an outward curved rim and two with black-burnished interiors. Associated black-on-whites included a significant number of Chupadero, and one Tabirá; Salinas Red sherds also occurred.

Among the artifacts recovered were numerous worked sherds of a variety of shapes and types, several tejas, and an associated pebble with one flat surface. One each of the following were found: bone awl fragment and tubular bone bead, small arrow point (cf. Toulouse, 1949, pl. 32c), and fragmentary limestone pipe. As was common in the fill at Abó, there were bird and mammal bones, occasionally some human fragments.

The presence of Corona Corrugated, which appears at Abó between the late 1100s and the beginning of the 1300s, indicates that Test II exposed refuse deposits which were a little older than those of Test I.

TEST III

South of the mission and directly across the arroyo from Abó spring, on property not owned by the state, I had been permitted to examine a partly vandalized unit of Abó ruin. From sherds associated, it was apparent that they pertained to an older occupation than that in which we had been working. Consequently, a third test was initiated nearby on state-owned land, about
75 feet north of the south boundary some 25 feet up the arroyo. A shallow trench was dug from east to west, and within 15 feet a north-south wall was encountered. Following this, a dwelling room was outlined.

**Room III-1**

The fill was found to be similar to that of the previous tests: windblown dirt, building stones, and an appreciable number of sherds. An adobe floor level measured 11'8" E-W and 6'11" N-S. The masonry consisted of big basalt rocks some two feet long and equally high, some even larger. Others were set with the bedding planes in a vertical position, as in room I-2 (Fig. 4). Smaller irregular stones were placed horizontally above the upright ones. A number of stone spalls were observed. No traces of wall plaster were found nor were openings noted in the walls. This suggests entrance through a hatchway in the roof.

A well-made firepit (Fig. 8) on the floor, parallel with the south wall, was filled with clean, compacted white ash and lined with a single rock slab on each of the four sides. The corners and floor of the pit were covered with adobe plaster. This feature was 14" E-W and 13.5" N-S and 10.25" deep.

Conspicuous amidst a few culinary sherds in the fill were some of Cieneguilla G/Y, an odd variety of Glaze C-D, a good, locally-made Glaze D, and one late E-early F which began ca. 1600. Also appearing was one sherd of Tabirá Black-on-white of like date. This array indicates that somewhere at close hand had been a collection of debris produced by residents of Abó during the 1300-1600s. Amongst the accumulation was a small fragment of selenite and one little charred corncob.

The floor was then removed for further investigation. Underneath was more debris to a depth of about three inches, and then another good adobe floor was reached. The space between the two floors constituted a sealed unit. It contained some 20 corrugated culinary sherds (A.D. 1100-1300); a good rim piece of Los Lunas Smudged ware (ca. A.D. 1100 or later); part of a Glaze A Red (Agua Fria G/R) jar and some sherds (A.D. 1315-1425);
Figure 8. Room III-1 cleared to the level of the first firepit. Note wall collapse.
a few Espinosa G/P and Tonque G/P of the Glaze C and C-D groups of A.D. 1400-1490. Intermixed with the glazes were sherds of Chupadero Black-on-white and one Affinis Santa Fe B/W. Also included were a few glazes of D and D-E (A.D. 1490-1515).

This bespeaks a slightly more confined time range, discounting a few heirloom possessions; the accumulation that had filled room III-1 was deposited primarily from A.D. 1300 to 1500, making this test somewhat earlier than test I. That a few artifacts were incapsulated with these ceramics indicates that they also may date to that period. They include a piece of a "beat up" implement made of gneiss and grooved for hafting or abrading; an arrow shaft tool of Meta sandstone; a platform scraper of chalcedony; and a charred corncob of somewhat larger size than others recovered.

On this floor, too, were firepits. First examined was a rectangular one 6.5" from the east wall and 2' 4" from the north wall. It was filled with white-gray ashes. Two small tabular stones, with adobe between, sat in the back wall of the pit at a right angle to the east wall. The pit was 15" x 10" and 6" deep.

The remains of a second firepit, dirt-filled, was uncovered 2' 4" from the interior west wall of the first firepit, and 2' 1" from the room's north wall. Some of the lining stones, burned completely red, had fallen into the interior, but others were missing. This pit, 10" x 10" and 9" deep, had a stone floor.

Still another firepit, the third, had been built in a larger, rectangular one which had been lined with slabs. The more recent pit had been set into the center of the original one, using the old east and west lining slabs and filling in with additional stones. This 17" x 26" feature was 17" from the north wall and 3' 3" from the east wall.

Beneath the second floor, further debris was encountered to a depth of approximately four feet where a coarse gravel layer was reached. Brownware sherds and specimens of the Corona Series, with corrugated-indent- smeared treatments on the exterior were recovered, including a "test pot"
rim and a worked sherd disc. Black-on-white types present included a rim with bird effigy, numerous Chupadero sherds in various combinations of black pigments and techniques, and a few Socorro Black-on-white with mineral paint. Glaze A (Agua Fria style, probably close to the time of its introduction in the early 1300s) appeared, and larger amounts of Cieneguilla G/Y, which dates from 1325 onward. In addition, Glaze C polychromes, dating between 1400 and 1490 and probably derived from Pottery Mound, and Glaze D were present (1490-1515). Also recovered were two sandstone tejas, the major part of an awl made from a long bone of a large animal, and a worked sherd of an unidentified glaze.

Room III-2

Just west of room III-1, another chamber, 6'6"x15', was excavated. It also was built on refuse and revealed the same type of masonry and fill. An oval pit, 5'1" from the west wall and 3" from the south wall, contained a few ashes, some bones, and dirt. A similar soft spot in the floor along the north wall contained like items.

The first of two firepits, uncovered 9" from the south wall and 6' from the east wall, measured 10"x13" and 7" deep. The second was 2'4" from the south wall and 5'9" from the west wall, measuring within a half inch of the first pit, being one inch deeper. Both contained clean, white-gray ashes and were lined and floored with sandstone slabs which were plastered, the top of the pits being flush with the floor.

Aside from sherds which were comparable to those in room III-1, extending through Glaze F and associated types, worked sherds included corrugated specimens, a well-rounded plainware disc, similar discs of Cieneguilla G/P, and ornamental shapes utilizing the designs on San Clemente Polychrome (Glaze A). Rectangular forms seem to have been most popular. Equally interesting were the worked sherds of Glaze C.

The fill of room III-2 proved to be unproductive, yielding only one charred stem end of a small corncob.

In summary, this test revealed that a major utilization of refuse at Abo was that of land fill and leveling. Thus crevices and uneven sandstone
surfaces approached the horizontal on which masonry structures were erected. When new floors were desired, refuse was deposited from some nearby source, leveled and used, or was covered with a layer of adobe plaster. Firepits were made so that their tops were flush with the floor levels.

The occupants of this unit of the pueblo were descendants of earlier peoples of a southern tradition, e.g., the makers of Jornado Brownware—a derivative of the Mogollon Root. Vivian found this ware at Gran Quivira and commented that it was first encountered in Rio Grande sites of the A.D. 800s. He felt that this ware led to the series designated as Corona (1964, p. 102; Toulouse and Stephenson, 1960, p. 33; Mera, 1935, p. 30). People lived in these Abó rooms, probably after A.D. 1150, as suggested by the small proportion of textured examples. The culinary ware they used chiefly was Corona Plainware. They had some jars of Chupadero B/W (A.D. 1150-1350); and other types of the 1100-1300 period.

Close to the turn of the 14th century, Glaze A appeared at Abó. The absence, or occurrence of but small numbers, of Glaze B, C, and D sherds indicates that little trading was conducted with sites to the north between A.D. 1400 and 1515. The late D-early E period evidenced the beginning of such influence after 1515; contacts broadened with districts near and far, and the real change came with the arrival of the Spaniards with new persuasions and demands which are surely reflected in the Glaze F development, with accompanying types of the 1600s.

Further details concerning these tests and of the more extensive Test IV will be included in the final article to be published in this series next year. Data will then be given for the four tests, with discussion.

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Sometime, probably in very late August or early September 1581, the second Spanish expedition to the Southwest, a little party of 9 soldiers, 3 friars, and 19 Indian servants, led by Captain Francisco Sánchez Chamuscado, reached the Tiguex or Southern Tiwa area of the central Rio Grande. The Indians of Tiguex, forty years before, had borne the brunt of the massive Coronado expedition (1300 or 1400 men, and large numbers of stock animals). They cannot have been eager to see Chamuscado and his party, however small. Forty years surely were not sufficient to allow the area with its 12 or 13 pueblos to completely recover from the population removal, massacre, and wholesale looting that characterized Coronado's stay.

In face to face relationships the Tiguex in 1581 were not willing to provoke the small party of Spaniards. They gave the invaders goods and other supplies (Hammond and Rey, 1966, p. 84), though sometimes only after Spanish bullying. Gallegos (Ibid., p. 94), for example, was convinced that the Indians simply feigned friendship.

It was probably the underlying fear and hostility of the Indians that decided Franciscan Fray Juan de Santa María to return to Mexico. He left the main party at a place which Hammond and Rey (Ibid., p. 95, n. 1)—for reasons not clear to me—identify as Tunque pueblo. The Indians followed him and killed him somewhere in the Manzano region (Ibid., p. 96), probably among the Tompiro.

The little party continued to have trouble with Indians. Horses were stolen at the pueblo of Malagón, perhaps San Lázaro (Ibid., p. 96, n. 4) or San Cristóbal (Reed, 1943, p. 260). The thieves were eventually caught, and the Spanish party debated but decided against burning the town. At their camp, with about a thousand Indians in attendance, the Spaniards went through a charade of beheading their captives only to have the friars—by
prearranged plan--rush in and save them (Hammond and Rey, 1966, pp. 97-98). The friars did this to pose as friends of the Indians. The two remaining Franciscans had made up their minds to stay in the Tiguex town of Puaray after the soldiers left, and wished to maximize their chances for success. The friars needed all the good will they could get for by the time Chamuscado left the country the entire area was aroused (Cuevas, 1924, p. 281).

A little about Puaray can be learned from the pueblo lists of Hernán Gallegos and Martín de Pedrosa, members of the Chamuscado party. According to Gallegos it lay above a pueblo the Spaniards named San Mateo and both pueblos were on the opposite side of the river from towns called Santa Catalina and San Pedro. Puaray was on the same side of the Rio Grande as the Sierra Morena which from other evidence would seem to be the Manzanos (Hammond and Rey, 1966, pp. 104, 131-132).

Pedrosa verifies this. Santa Catalina which contained many cottonwood trees was on the same side of the river as San Pedro. Across on the other bank "on the side of the Sierra Morena" was San Mateo and above it Puarai (Puaray) (Ibid., pp. 116-117). Whatever else they tell us, these accounts seem to place Puaray on the east side of the river.

One other interesting fact emerges from the accounts of the Chamascado expedition. Although Puaray is only one of a number of towns in the Tiguex area, on the Gallegos and Pedrosa lists it was the pivot on which the Spaniards' explorations swung. According to the account of Pedro de Bustamante, another member of the party, after a side trip eastward from the Rio Grande valley to the edge of the bison hunting area, the Spaniards retraced their steps to Puaray. From there they explored westward to Zuni. Then returning "to Puaray, their starting point" . . . (Ibid., p. 131), Spaniards explored the region of the Salinas beyond the Sierra Morena. From this Manzano-Tompiro area Chamuscado's party returned once again to Puaray "where they had left the friars, the horses, and the rest of their equipment; and from Puaray they turned back to retrace the route over which they had come. The friars and their Indian servants, including one mestizo, remained at the aforesaid pueblo" (Ibid., p. 132).
Against the advice of the Captain Chamuscado and the other soldiers, and after a legal document had been drawn up placing the decision firmly on their own shoulders, the Friars Agustín Rodríguez and Francisco López remained at Puaray while the little party toiled its way back to New Spain. Even granted the obsessive legalism of the Spanish 16th century, it does seem that Chamuscado and his men feared for the friars and wished to document the fact that their actions were clearly their own. Fears of the soldiers were realized; the friars were killed probably shortly after Chamuscado left (Ibid., pp. 125-126, 177), along with three young male Indian servants and a mestizo man (Ibid., p. 221).

Concern about the friars and desire to further examine mining possibilities in New Mexico led to another expedition which left San Bartolomé on November 10, 1582. This expedition was led by Antonio de Espejo with fourteen soldiers, the family of one of the soldiers, a number of Indian servants, and one friar, Bernardino Beltrán. A second friar Pedro de Heredia is listed in two of the three major accounts but probably did not actually go on the expedition.

We have reasonably good information on this expedition. Three separate accounts survive, the journals of Diego Pérez de Luxán and Espejo, himself, and the material from Baltasar de Obregón, taken mainly from Bernardino de la Luna, a member of the party.

On February 16, 1583, the Espejo party reached the pueblo of Puaray, having entered the Tiguex country, probably, on February 14. Espejo already knew the Fathers Rodríguez and López had been killed at Puaray and now found that Indians throughout the Tiguex area had understandably absented themselves. According to Luxán (Ibid., p. 177), "The inhabitants of all these settlements had fled to the sierra because all had taken part in killing the friars."

The Espejo party explored very widely in the Southwest. They reached the Tompiro area to the east, went north as far as the Tewa-Tano towns, westward to Zuni and Hopi, and from there to central Arizona where Espejo discovered the rich mines of the Jerome area (Riley, 1976, p. 36). On their
return from the Hopi country about half the party including the friar deserted when the party reached Zuni, and went separately to New Spain. The eight remaining Spaniards continued on eastward going by the thirteen Tiguex pueblos again, and this time burned Puaray, garroting and shooting 16 of the natives and incinerating others in the pueblo (Hammond and Rey, 1966, p. 204). These unfortunates seemed to have been a remnant group who had remained behind when the rest of the people fled to the mountains. Perhaps they were old and infirm individuals; at any rate they seem to have put up little or no resistance to the Spaniards.

The location of Puaray (called by the Espejo party Paula or Pualas) is not made very clear but it was close to the Rio Grande with cottonwoods nearby, and had at least two other pueblos in the near vicinity (Ibid., pp. 177, 203-204). It was town with "four hundred houses, most of them two stories high, not counting the ground floor, which makes three stories" (Ibid., p. 177). Curiously enough, the Chamuscado party a year or so before had listed the number of houses in Puaray as 123 (Gallegos) or 112 (Pedrosa) (Ibid., pp. 104, 117). We are not sure, of course, if Gallegos-Pedrosa and Luxán meant the same thing by the word "house."

Gaspar Castaño de Sosa, approaching the Tiguex country from the north in early 1591, certainly visited Puaray although he does not mention the pueblo by name, only saying that it was where the friars were killed (Schroeder and Matson, 1965, p. 168). One of Castaño's men, Juan Rodríguez, testified in the Valverde inquiry of April 1602 that "he took the latitude of Puara when he entered the land with Castaño de Sosa and found it to be 34 ½° . . . " (Hammond and Rey, 1953, pp. 870-871).

Juan de Oñate was not nearly as interested in the Tiguex as he was in the Tewa and Keresan groups farther north. He found the Tiguex country mainly deserted, the people fleeing at the approach of the Spaniards, though he did note "many pueblos, farms, and planted fields on both banks of the river" (Ibid., p. 319). Reaching Puaray on the 27th of June, 1598 the army seems to have halted while the governor and maese de campo went on to Santo Domingo, six leagues away, to find the Indians Tomás and Cristóbal who had
been left from the Castaño expedition and who were needed as interpreters. With these two Indians, Onate returned to Puaray from where Tzia (Zia) was explored on June 29. The following day the party went on to San Felipe "almost three leagues, then to Santo Domingo, nearly four leagues farther" (Ibid., p. 319).

Onate does not mention it, but according to Villagrá (1933, p. 142), while at Puaray the party saw poorly concealed paintings of the deaths of the Chamuscado friars on the walls of a kiva.

Relatively little is known of Puaray in the 17th century. In 1664, the pueblo named Pueras (certainly Puaray) was listed as a visita of Sandia (Vivian, 1932, p. 28). The location of 17th century Sandia is not absolutely certain but it is probably at or near to the later, 18th century settlement of Sandia, which exists today.

By the time of the great Pueblo Revolt of 1680, the Tiguex area had been reduced to four pueblos: Alameda, Sandia, Puaray, and Isleta, of which the first three joined the rebellion. The reconquest by Vargas beginning in 1692 saw the Tiguex largely destroyed. Isleta people had in part moved to the El Paso area, the Sandia group fled to Hopi country, where they stayed until the mid-18th century, and Alameda and Puaray simply disappeared from history (Ibid., p. 37).

THE LOCATION OF PUARAY

The exact location of this ill-starred pueblo has been contented for a century or more. One of the first serious attempts to identify Puaray was that of Adolph F. Bandelier, who, in the 1880s, did extensive studies of both the archaeology and the early history of the Southwest. Bandelier based his identification on the statements of contemporary Sandia Indians and by a reading of the "González grant" (an 18th century deed of sale from Juan de Urribarí to Juan González Bas with a confirmatory auto de posesión), a document which Bandelier borrowed and copied from the Santa Fe antique dealer Alexander (Jake) Gold (Bandelier, 1892, p. 227; Lange and Riley, 1966, p. 87). Bandelier visited and sketched the ruins of what he
considered Puaray on June 6, 1882 (Lange and Riley, 1966, pp. 313-315). Bandelier's Puaray (now designated site LA 326) is on the west bank of the Rio Grande some two and a half kilometers south of the site of Kuaua and across the river from the present town of Bernalillo. Excavations at the site were undertaken in 1934 (see Vivian, 1934; Tichy, 1939) and the reports indicate that Bandelier's Puaray was an important town in the 16th century province of Tiguex. Like Kuaua (excavated in 1934-1939, see Dutton, 1963, p. 20), Bandelier's Puaray is a candidate for the town used by Coronado as headquarters in the period 1540-42. However, there was no indication that LA 326 was the 16th or 17th century Puaray.

In a study of the three Tiwa pueblos that joined the Pueblo Revolt of 1680, Hackett (1915, p. 383) suggested that Puaray, Sandia, and Alameda were physically quite near each other, only Alameda being on the west side of the river. Gordon Vivian did a careful survey of the Tiguex area in 1932, correlating documentary and archaeological evidence. On the basis of this study he came to the conclusion that Puaray lay between Alameda and Sandia, on the east bank of the Rio Grande. At that time the site was designated as number 13 of the Fisher archaeological survey, and in the modern Laboratory of Anthropology designation it is site LA 717.

More recent attempts have been made to identify Puaray. A. H. Schroeder in a detailed analysis of the Castaño de Sosa route, identified Puaray with site LA 677, a pueblo ruin some three and a half kilometers east and across the Rio Grande from Kuaua, in other words in the northern part of present-day Bernalillo. Schroeder bases his identification in part on the fact that Juan Rodríguez, who took the latitude at Puaray (see above), must have done so on the first day Castaño spent among the southern Tiwa since Rodríguez and the majority of the party returned to the base camp at Santo Domingo on the second day (Schroeder and Matson, 1965, p. 171). Castaño, as pointed out above, approached Tiguex from the north and on the first day would have been on the northern fringe of the province.

Writing about ten years later Snow (1974, pp. 465-470, 477) reaffirms the Vivian identification of Puaray as LA 717. Snow does this in part by a reevaluation of the Gonzáles grant document, utilizing Bandelier's manu-
script copy done in 1880 (the original has since disappeared).

Leaving aside a specific identification for the moment, it is interesting to see the things on which all recent investigators agree. These are that Puaray was on the east side of the Rio Grande, fairly close to the river, and in flat open country. It would, of course, be very useful to pinpoint Puaray in terms of the Coronado Tiguex towns. Although we are not able to do this with absolute certainty, the Coronado material, itself, allows us to make still another "fix" on Puaray.

PUARAY AND THE TIGUEX PROVINCE OF CORONADO

The great emphasis in studies of Puaray has been upon identifying the late 16th century pueblo with 17th century Puaray. Researchers have tended to ignore the fact that Puaray (though not mentioned by that name) must also have been visited by Coronado. In fact, the town probably played an important role in Coronado's relations with Tiguex and an examination of that role is a major purpose of this paper.

The clue to Coronado's Puaray comes in a passage by Diego Pérez de Luxán (Hammond and Rey, 1966, pp. 185-186).

We learned from the interpreters that two of Coronado's captains were in this pueblo /Hawikúh/ for two years, that from here they went to discover some provinces, and that when Coronado was at Puala de los Mártires (where the friars had been killed) he came to the above-mentioned pueblo of Acoma, made war on the inhabitants, and they surrendered. In Acoma, he was informed that the inhabitants of Puala, who are Tiguas, and those of the surrounding district, had killed ten of the horses left there by Coronado for the people in the garrison. When Coronado heard of the incident, he set out for Puala, whose people are Tiguas, and besieged them near a pueblo encircled by mountains. He pressed them so hard that those who did not die at the hands of the Spaniards--Coronado's people, whom the natives called Castillos--died of hunger and thirst. (Chamuscado and his men were not
ignorant of this. They knew it all, but refrained from telling about it in order that others might come to settle the land.) Finally the people of Puala surrendered and threw themselves on Coronado's mercy, and he took as many, both men and women, in his service as were necessary, and returned to this pueblo. From here he set out for the valley of Samora /Senora/, which must be one hundred leagues distant from this province.

This account of Luxán is a very abbreviated and rather garbled sketch of Coronado's activities in the Rio Grande valley. It does, however, clearly link Puaray with some of the central events of the Coronado expedition. In order to understand more clearly what went on in Coronado's time we need to summarize these events, for the situation in Tiguex in the latter part of the 16th century relates directly and drastically to Coronado's activities and cannot be properly understood without considering certain implications of the Coronado expedition.

What actually happened to Tiguex during the Coronado period (1540-42) has never to my knowledge been properly evaluated, even though a great mass of data, published and unpublished, has been available for many years. The reason, I suspect, is that scholars interested in the period were basically writing from the Spanish point of view. Because of this they failed to recognize the full political and economic implication to the Indians of Coronado's occupation of Tiguex.

Francisco Vásquez de Coronado, Governor of New Galicia and commander of the Cíbola expedition brought a very large party from western New Spain northward to discover the new lands of Cíbola. After two small exploratory parties reached the Southwest in 1539, the major Coronado party began its long trek up the west coast of Mexico in the spring of 1540. Coronado had between 300 and 350 Spaniards and at least 1,000 Indian allies, an undetermined number of servants and slaves, and perhaps 1500 head of stock; horses, mules, cattle, sheep, and probably goats. Coronado pushed on northward with an advanced guard of around 80 horsemen and 25 foot soldiers plus the Franciscan friars and a number of allies and servants. The main
army burdened by large numbers of stock animals and the supply train followed along behind.

Coronado reached Cíbola-Zuni on July 7, 1540 and after a skirmish took the town. He rapidly pacified Cíbola-Zuni and sent out a series of exploring parties. Hopi and later the Grand Canyon were visited in the west, and another group traveled eastward to the Rio Grande and the High Plains. Commander of the latter force, Hernando de Alvarado, sent word that the Tiguex area of the central Rio Grande would make better winter quarters than Cíbola. The problem of a winter camp was exacerbated by the fact that many of the Spanish provisions were on the ship San Gabriel, part of the flotilla of Hernando de Alarcón, which was sailing up the Gulf of California. A party commanded by Melchior Díaz missed Alarcón on the lower Colorado by only a few days and Alarcón sailed back to Colima with the supplies.

Coronado, meanwhile, sent his subordinate, García López de Cárdenas, with a small party to Tiguex to prepare winter quarters, Coronado waiting at Hawikuh for the main Spanish party. García López de Cárdenas found 12 to 14 Tiguex pueblos within an area of a few leagues of one another, approximately half on one side of the river and half on the other (ICC, testimony, Melchior Pérez). He evicted the Indians from a large pueblo which according to Coronado (Hammond and Rey, 1940, p. 329) was on the banks of the Rio Grande, a pueblo that Coronado called Coofer, and López de Cárdenas Alcanfor (Ibid., pp. 326, 347). The name Coofer (or some near variant, Cooser, Coofort) is also reported in the 17th century by Tello (1891, pp. 414, 436) and in the 18th by Mota Padilla (Day, 1940, p. 98), both of these latter writers probably drawing it from the now lost papers of another member of the Coronado expedition, Pedro de Tovar. Although Coronado and López de Cárdenas claim that the Tiguex inhabitants of the town willingly vacated it (Ibid., p. 347), the consensus of others who saw these events was that force was used or threatened (see for example Hammond and Rey, 1940, pp. 219-220). The exact location of Coofer is not known but the statement of Domingo Martín (ICC), that it was the first pueblo reached by the Spaniards
coming from Cibola-Zuni, suggests that it was on the west bank of the Rio Grande.

The Alvarado party, back from the Plains, joined López de Cárdenas at Coofer shortly after his arrival. Coronado, who with a small party was exploring the region of the Piros, reached Coofer sometime later, and in December 1540 the main army arrived from Cibola.

The massive Spanish and allied army, 1300 or more strong, with many hundreds of stock animals but no food reserves, put an intolerable burden on the province of Tiguex. Without the supplies from Alarcón's ships, both Spaniards and central Mexican allies suffered for lack of winter clothing. In addition, evidence suggests that the winter of 1540-41 may have been an unusually severe one, with bitter cold along the river and very deep snows in the mountains.

In any case, hostilities flared almost immediately. The Tiguex pueblo called Arenal, Del Cerco, or El Circo soon decided to put the Spaniards to the test. Arenal, according to López de Cárdenas, was "three or four leagues" from Coofer (Hammond and Rey, 1940, pp. 358-359). Other accounts indicated that the towns were two leagues apart (García del Castillo and Pedro de Navarro testimony RSC) or even one-half league (Hernando de Alvarado testimony RSC, Hammond and Rey, 1940, pp. 352-353). It seems reasonably clear from the López de Cárdenas testimony (Ibid., p. 348), especially when taken with various other statements, that Coofer and Arenal were on opposite sides of the river (see especially García del Castillo, Pedro de Navarro, Juan de Fíoz testimonies RSC; Juan Troyano testimony ICC; Hammond and Rey, 1940, pp. 225, 332, 347-348, 352-353). Quite possibly, the estimates of distance differ because some Spaniards were talking of the trail that went from Coofer along the river to a ford, then on to Arenal, while others were giving "as the crow flies" estimates.

Arenal was near two other pueblos, which one account names as Pueblo de la Alameda and Pueblo de la Cruz (Rodrigo de Frías testimony in ICC). The Coronado testimony (Hammond and Rey, 1940, p. 335) suggests that Alameda lay between Coofer and Arenal. In any case, Arenal, itself, was in flat
country and near the river.

The events that began in December of 1540, and lasted through the severe winter months of 1541, have been graphically described in testimony by Juan Troyano, a Spaniard who had come to the New World with Viceroy Mendoza and was a respected figure in the Coronado expedition. According to Troyano's statements in the Información Contra . . . Coronado the rebellion was triggered by several factors. They included López de Cañadas' high handed action in taking over a pueblo, Spanish animals' destruction of Indian crops, and Spanish demand for goods, especially for blankets. The final straw, however, was the unpunished rape of an Indian woman by a soldier--with influential relatives in Mexico--named Villegas.

Striking at night the Indians killed or rustled more than 40 horses, mules and pack animals, taking them from the Coofer side of the river, but eventually crossing with some of the horses and actually enclosing various of them at Arenal (Hammond and Rey, 1940, pp. 225, 348; Troyano testimony ICC; García del Castillo testimony RSC). The Spaniards led by López de Cáñadas marched to Arenal which, being on the flat was difficult to defend. Surrounding the pueblo with artillery and setting fires at various points, López de Cáñadas forced the Indians to surrender. A number of Indians (60 according to Troyano, though other accounts give larger numbers) received the sign of the cross from López de Cáñadas, a signal for peaceful surrender. They were treacherously seized, some put in a tent and others tied to stakes and burned. The Indians in the tent tried to break out but were lanced.

A second pueblo in a better defensive position, called Moho or Mohi by Coronado and El Cerco by most others, resisted and withstood the Spaniards through much of the harsh winter of 1541. Finally succumbing to thirst the inhabitants attempted to break out and flee to the river, presumably the Rio Grande. Large numbers of them were lanced, killed by dogs, or burned as the Spaniards finally gained entry into the pueblo. Many of the Indians had their hands or noses chopped off.
Troyano placed the blame for these atrocities on Coronado and López de Cárdenas. He might be suspected of Indian sympathies since he is the only Spaniard known to have married a northern girl, almost certainly Pueblo—in fact, one who could have been either Tiwa or Tano (see Troyano, 1940, p. 277; Riley, 1975, p. 459). The Troyano story, however, is repeated by other leading members of the Coronado party, often with grisly details more damning than those of Troyano himself.

A significant development in the winter of 1540-41 was the destruction of all the Tiguex pueblos. According to Troyano thirteen of the towns deserted by the Indians were looted and dismantled by the Spaniards. Other members of the Coronado expedition agreed. In the Información contra Coronado, Alonso Sánchez stated that Arenal and nine or ten other pueblos were burned. Juan de Paradinas spoke of the burning of all Tiguex pueblos. Juan de Contreras stated that 13 pueblos were burned to keep the Indians from returning to them. Cristóbal de Escobar testified that the Spaniards burned all 13 of the Tiguex pueblos so that the Indians could not return to them. Melchior Pérez stated that the Spaniards devastated and burned 12 or 13 pueblos besides the ones fortified and defended. Pedro de Ledesma said that only nine were burned (pueblos were hard to fire). Juan de Zaldívar stated that the deserted pueblos were actually torn down because the Spaniards needed wood for their fires. They did not dare go into the mountains because of deep snow and fear of enemies. Alonso Alvarez also indicated that the Spaniards dismantled the pueblos for firewood.

Emerging clearly in the accounts of that terrible winter is a picture of thorough devastation. Arenal, on the flats, along the eastern side of the Rio Grande, was burned and its inhabitants enslaved or killed after a desperation rebellion. Treachery followed this tragedy as individuals surrendering under strong religious guarantees were murdered, and the Tiguex fled their towns except for the pueblo, El Cerco or Mojo. This latter town was fairly near the river and was built on a ridge, easily defended on three sides. The flat area in front of the pueblo was reinforced by a stockade (see testimony of Francisco Gorbalán in RSC; Tello, 1891, p.
The Spaniards attempted to batter down this front wall but the defenders with their bows concentrated such fierce enfilading fire that they drove Coronado's men from the area with considerable loss (Tello, 1891, pp. 422-424; Day, 1940, pp. 100-101). It was lack of water, not Spanish power, that finally forced out the defenders after two months of siege. Women and children seem mostly to have been taken slaves, but the men were killed or mutilated (ICC testimony Rodrigo de Frías, Alonso Alvarez, Juan Troyano, Juan de Contreras, Domingo Martín, Alonso Sánchez).

By the spring of 1541 Tiguex was largely destroyed. All the towns were occupied or burned and the Indians were driven to the mountains, enslaved, or killed. From the mountains (likely the Sandias, and perhaps the rough lands of the Jemez plateau), Tiguex Indians maintained a guerrilla warfare against the Spaniards. In late April 1541, Coronado moved his army to the High Plains. Most of the Spanish army returned to Tiguex in the summer finding that some of the inhabitants had attempted to resettle the area. At the approach of the Spaniards, the Tiguex fled once more (Hammond and Rey, 1940, p. 243).

Spanish occupation of Tiguex in 1540-42 left the province—probably the strongest and most important in the entire Rio Grande valley (Tello, 1891, p. 412)—severely crippled. Not only had numbers of people been killed or wounded but the Indians had lost their pueblos, their stores of food and clothing, and use of their land.

In 1581, when the Spaniards returned, Tiguex was making a recovery but the scars of the Coronado occupation were still very real. My belief is that population had declined drastically; the formula used by Dobyns (1966, p. 414) in calculating population loss in the southern Arizona area (and indeed throughout the post-Columbian New World) surely applies equally well here. Except for Chamuscado, no Spanish party after Coronado really had must interest in Tiguex, probably because there was little left but poverty. Espejo concerned himself with the western pueblos and the Keres, and Castaño with Pecos, the Tewa, and Keres. Oñate, though he occupied the whole pueblo area, centered his activities on the Tewa and the Keres.
The Luxán description of the relationship of Coronado's party to Puaray, combines events that took place in Arenal and El Cerco/Mojo. However, Puaray cannot be El Cerco because the latter pueblo was far enough onto the flanks of the mountains to be easily defended, even from a very large Spanish-Mexican army. Luxán is mixing two traditions, but his Puaray is very likely Arenal. If Puaray/Arenal is LA 717 or LA 677, then Coofer may well be Kuaua or LA 326 (Bandelier's Puaray)--though the distances are not quite right for LA 717 and one cannot rule out one of the more southern Tiguex sites on the west bank of the Rio Grande. One difficulty in locating the town is that we do not know for certain if Coofer was upstream or downstream from Arenal.

My guess is that the fascination with Puaray/Arenal on the part of Chamuscado's friars has a simple explanation. If Luxán is correct, the Chamuscado people understood very well the history of Puaray, and they probably also knew that López de Cárdenas had later been punished for his misconduct there. If so, the Franciscan determination to missionize Puaray becomes understandable in terms of Franciscan apostolic thinking. Puaray, the town illegally destroyed by the Spaniards, becomes the religious challenge of two generations later. If Puaray could be missionized surely any Rio Grande pueblo would receive missionaries. It was a noble idea and one that took courage on the parts of friars Rodríguez and López. It also makes understandable the frenetic attempts of the pragmatic Chamuscado to persuade the friars to return to Mexico. Chamuscado was right. The experiment decidedly did not work out.

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SPANISH INFLUENCES ON THE POTTERY OF
SAN JOSE DE LOS JEMEZ AND GIUSEWA
JEMEZ STATE MONUMENT (LA 679), JEMEZ SPRINGS, NEW MEXICO
MARJORIE F. LAMBERT

The monument encompasses the 17th century mission church and monastery, San José de los Jémez, and the Indian Pueblo, Giusewatowa ("pueblo of the hot place").

The pueblo was once one of the largest and most powerful in the Jemez Nation. Because of its location and nature, it was chosen by the Franciscans as the proper locale in which to concentrate the populations of surrounding Jemez villages.

In order to construct the Spanish edifices and to accommodate influxes of additional Indians, parts of the existing pueblo were destroyed and/or altered.

The three Franciscan attempts to Christianize the Jemez Indians were doomed from the outset. Conversion activities were ended by 1630, or shortly thereafter. The history and architecture of San José de los Jémez are described elsewhere (Lambert, 1976, pp. 179-197).

The following discussion grows out of two School of American Research-Museum of New Mexico expeditions, one conducted at the site in 1921-22, and the other in 1936-37. The Museum of New Mexico also stabilized San José de los Jémez church in 1965, as well as exposing four pueblo rooms (Fig. 1).

Some years ago I launched a search for notes, artifacts, or such data that might pertain to both the mission complex and the pueblo. All available sherds and ceramic specimens were assembled and subsequently studied (Tables I, II, III). Nevertheless, I have been somewhat hesitant to present the results of this analysis, first, because only Indian-made pottery could be found, second, field notes were almost non-existent, and finally, because of an almost total lack of European artifacts and/or pottery. Such materials, I feel, would certainly have been part of the
Figure 1. Ground plan of LA 679, based on 1921-1922 and 1936-1937 excavations. Plan and all other figures drawn by Phyllis Hughes.
17th century cultural inventory of San José de los Jémez, especially since Fray Alonso de Benavides, who came to New Mexico in 1625, said Fray Zárate Salmerón, in the fall of 1621, "founded a very beautiful convent and temple in the principal town dedicated to San Joseph" (Bloom and Mitchell, 1938, pp. 94-95). According to Bloom (1923, pp. 15-20), the 1921-22 expedition excavated Spanish-manufactured items, including dishes, wheat and fired oblong or square bricks. Aside from photographs and copies of the church murals, no notes, catalog, nor artifacts from the 1921-22 expedition can be located today, so the nature and quality of such items, if they existed, remains a mystery.

As further proof that Spanish artifacts should have occurred at San José, let us turn to numerous Indian-Spanish contact sites of the Southwest wherein hundreds of Iberian articles of this period have been reported (Di Peso, 1974, pp. 916-956; Ely, 1935, pp. 131-135; Hayes, 1974, figs. 20, 29; Kidder, 1932, pp. 305-308, figs. 250-251; Lambert, 1954, pp. 160-162; Montgomery, 1949, pp. 197-199, 202-213; Toulouse, 1949, pp. 21, 23-24, figs. 31-33, pls. 24-30; Smith, et al., 1965, pp. 64, 98-134; Vivian, 1964, pp. 136-137, figs. A-F).

Returning now to San José de los Jémez, one is reminded that soldiers were garrisoned here from time to time because of the unfriendly nature of the local inhabitants. Yet not a single piece of metal or fragmentary military equipment is reported from LA 679.

Even though the mission occupation was sporadic, it functioned long enough, one would think, for household items such as Spanish-made crockery to have been broken, yet again only one Iberian potsherd, San Luis Blue-on-cream, appeared in the two lots of pottery I classified. One rectangular, fired adobe brick, and a well-carved gypsum serpent's head are the other two Iberian artifacts from the monastery and church areas excavated in 1936-37. The serpent's head, a fragment, may be part of the ornamental base of a religious statue.

Since the elegant and imposing San José de los Jémez Mission complex compares favorably with other Southwestern Franciscan religious establishments, why no reported Spanish artifacts? It can only be assumed that such
materials were not considered important enough to save, or were lost, or discarded during past decades of storage reorganization. Possibly Bloom or others sent such material away for analysis, and no report was ever made nor artifacts returned.

It is perhaps probable that both Friars Zárate Salmerón and Martín de Arvide took with them a few portable church and monastery items when their respective mission efforts failed, but such evacuations could not have meant the total removal of everything, I should think.

Since the Jemez Indians had resisted all Christianizing attempts, it can probably be assumed that the Giusewa inhabitants kept very little or nothing pertaining to the Spaniards when the pueblo was abandoned prior to the 1680 Pueblo Indian Rebellion.

There is one final explanation to account for the lack of Iberian-made artifacts, although it is an improbable one; it being that none were brought, or used by any of the three friars stationed here.

The following observations are based on sherds from 16 pueblo rooms and a circular plaza kiva, all to the west and southwest of the church (Map and Table I) and ceramic material from 24 monastery rooms and monastery environs (Table II). Both aggregates of sherds are the product of the 1936-37 excavations. Since Giusewa is believed to have existed long before the 17th century Spanish activities there, it was my intention to see if there were time and style differences in the pottery of the two localities (Fig. 2).

It is not clear what the fill of rooms 100:A-116 represents, but because of the abundance of pottery, especially the locally made Jemez Black-on-white and regional utility wares, I am inclined to believe the dwellings were used as refuse areas by occupants of nearby apartments. Scantily represented are pre-Spanish sherds such as Abiquiu and Bandelier Black-on-gray, plus glaze-decorated types A, B, and C. These potsherds, plus similar examples found elsewhere at LA 679, are evidence of a pre-Spanish settlement at Giusewa. Rooms 100:A-116 also might have been purposely filled as the existing houseblock was being altered to accommodate Jemez Indians being brought here for Christianizing. It came as no surprise to discover that the wares of both the monastery and the rooms in the pueblo houseblock
Figure 2. Late period Jemez B/W bowl, and pot sherds of the same type. Bowls of this shape and design were in vogue from the early 14th century into the 1700s.
were indeed contemporaneous, the main difference being that the amount from the monastery was considerably less (Tables I-II).

The Jemez Black-on-white pottery of LA 679, with few exceptions, is no different from that which occurs throughout the Jemez Mountains in sites of the 14th century onward. For a detailed description of Jemez region pottery see Reiter (1938, Vol. II, pp. 118-155). It reflects the Jemez potter's provincialism and tenacity to cling to long extant ceramic forms and designs. Regional isolation is also reflected by the fact that there are very few imported sherds from other Southwestern sites. One rather interesting example of borrowing was observed on a few Jemez Black-on-white bowl sherds, the rims of which are copies of glaze paint ware, probably of the Zia area to the south. A series of Jemez Black-on-white sherds examined by H. Warren at my request contained crushed crystal pumice temper similar to that in Jemez Black-on-white sherds from the Jemez pueblo of Unshagi, described by A. Shepard in 1938 (Warren, personal report, 1968). Warren also checked culinary or utility ware sherds finding that "lithic tuff was apparently used for temper in the 200 culinary sherds examined from LA 679. The materials of the tuff vary considerably, but often have rounded edges resembling sand grains" (Ibid.).

According to Warren, the source of the temper material "is probably partially welded ash flow tuffs containing fragments of crystal pumice, vesicular volcanic glass, and/or vitrophyre. Ash flow tuffs of this type are common in the volcanic rocks of the Jemez Mountains" (Ibid.).

While the tempering material of Jemez utility pottery is fairly uniform, the surface treatment of vessels is varied and often appears careless. The classification of Jemez Black-on-white and the utility wares of Guisewa and San José Mission (Tables I-II) added nothing new to that already described by Reiter and Shepard (Reiter, 1938, Vol. II, pp. 118-155).

Even though the 17th century Franciscan missionary endeavors failed at San José de los Jémez, the friars wittingly or unwittingly left behind indelible marks of their Iberian heritage. Most obvious, of course, is
Table I. Pottery from rooms 100-116, houseblock west-southwest of church.

| Room Areas or Rooms | Jemez B/W Bowl | Jemez B/W Closed Form | Jemez B/W Spanish Form | Glaze Decorated Bowl | Glaze Decorated Closed Form | Glaze Decorated Spanish Form | Course Plain, or Striated Culinary Ware | Slightly Smoothed Culinary | Smooth Plain, or Scrapeed | Corrugated, or Smeared Corrug | Incised Plain Culinary | Basket Impression Culinary | Ribbed Culinary | Historic Plain Red | Kapo Black | Abuqai B/G | Bandawic B/C | Potsuri Incised | Punane Polychrome | Jeddito B/Y | Total |
|---------------------|----------------|-----------------------|------------------------|---------------------|---------------------------|-----------------------------|---------------------------------------------|----------------------------|-----------------------------|----------------------------|------------------------|-----------------------|----------------|----------------|-----------|----------------|----------------|----------------|----------------|----------------|
| 100:A               | 443            | 79                    | 3                      | 20                  | 3                         | 0                           | 348                                         | 56                          | 27                          | 2                          | 1                      | 1                     | 1             | 1             | 1                     | 16813           | 822             | 995             | 4         | 143           | 12           | 16           | 1         | 3              | 2       | 36901    |
| 101                 | 992            | 453                   | 3                      | 30                  | 3                         | 2                           | 1459                                        | 55                          | 3                           | 213                        | 3                      | 1                      | 1             | 1             | 1                     | 1984            | 162             | 13             | 1         | 1             | 4            | 1            | 1         | 1             | 2       | 37003    |
| 103:A-B             | 1911           | 695                   | 4                      | 104                 | 28                        | 2                           | 1992                                        | 102                         | 22                          | 21                        | 1                      | 1                      | 1             | 1             | 1                     | 14871           | 488             | 59             | 1         | 1             | 4            | 1            | 1         | 1             | 1       | 4877     |
| 104                 | 229            | 63                    | 5                      | 1                   | 3                         | 5                           | 123                                         | 1                           | 41                          | 4                          | 1                      | 1                      | 1             | 1             | 1                     | 486              | 285             | 285             | 1         | 1             | 4            | 1            | 1         | 1             | 1       | 285      |
| 105                 | 160            | 55                    | 1                      | 3                   | 1                         | 1                           | 172                                         | 13                          | 1                           | 1                          | 1                      | 1                      | 1             | 1             | 1                     | 197              | 250             | 250             | 1         | 1             | 4            | 1            | 1         | 1             | 1       | 250      |
| 106                 | 9              | 1                     | 1                      | 1                   | 1                         | 1                           | 179                                         | 2                           | 1                           | 1                          | 1                      | 1                      | 1             | 1             | 1                     | 1                | 197             | 197             | 1         | 1             | 4            | 1            | 1         | 1             | 1       | 197      |
| 107                 | 32             | 21                    | 1                      | 8                   | 4                         | 3                           | 1068                                        | 17                          | 19                          | 21                        | 213                    | 1                      | 1             | 1             | 1                     | 1850             | 250             | 1850            | 1         | 1             | 4            | 1            | 1         | 1             | 1       | 285      |
| 108                 | 239            | 402                   | 6                      | 57                  | 22                        | 1                           | 2181                                        | 56                          | 1                           | 275                        | 18                     | 1                      | 1             | 1             | 1                     | 4715             | 847            | 4715            | 1         | 1             | 4            | 1            | 1         | 1             | 1       | 8473     |
| 109                 | 1668           | 420                   | 1                      | 54                  | 28                        | 1                           | 2181                                        | 56                          | 1                           | 275                        | 18                     | 1                      | 1             | 1             | 1                     | 1840             | 2284           | 2284            | 1         | 1             | 4            | 1            | 1         | 1             | 1       | 2284     |
| 110                 | 2803           | 1161                  | 5                      | 109                 | 113                       | 1                           | 3787                                        | 250                         | 18                          | 214                        | 5                      | 4                      | 1             | 1             | 1                     | 143              | 16             | 16             | 1         | 4             | 1            | 1            | 1         | 1             | 1       | 16813    |
| 111                 | 1563           | 530                   | 1                      | 105                 | 32                        | 1                           | 1879                                        | 159                         | 7                           | 71                          | 4                      | 2                      | 1             | 1             | 1                     | 891              | 40              | 40             | 1         | 1             | 1            | 1            | 1         | 1             | 1       | 1984     |
| 112                 | 222            | 95                    | 1                      | 14                  | 6                         | 4                           | 489                                         | 14                          | 1                           | 1                          | 1                      | 1                      | 1             | 1             | 1                     | 126              | 50              | 50             | 1         | 1             | 1            | 1            | 1         | 1             | 1       | 126      |
| 113                 | 193            | 28                    | 4                      | 1                   | 1                         | 1                           | 184                                         | 24                          | 1                           | 1                          | 1                      | 1                      | 1             | 1             | 1                     | 1                | 197             | 197             | 1         | 1             | 4            | 1            | 1         | 1             | 1       | 197      |
| 114                 | 704            | 264                   | 1                      | 52                  | 29                        | 1                           | 1179                                        | 15                          | 32                          | 6                          | 1                      | 1                      | 1             | 1             | 1                     | 126              | 50              | 50             | 1         | 1             | 1            | 1            | 1         | 1             | 1       | 126      |
| 115                 | 642            | 295                   | 1                      | 42                  | 18                        | 1                           | 891                                         | 40                          | 2                           | 50                          | 1                      | 1                      | 1             | 1             | 1                     | 1                | 197             | 197             | 1         | 1             | 4            | 1            | 1         | 1             | 1       | 1984     |
| 116                 | 533            | 198                   | 40                     | 20                 | 1                         | 1                           | 827                                         | 50                          | 1                           | 2                          | 1                      | 1                      | 1             | 1             | 1                     | 1                | 1675            | 1675            | 1         | 1             | 4            | 1            | 1         | 1             | 1       | 1675     |
| TOTAL               | 12343          | 4790                  | 26                     | 640                 | 315                       | 9                           | 16813                                       | 822                          | 60                          | 995                        | 4                      | 143                     | 12            | 16           | 4                     | 1                | 16813           | 16813           | 1         | 1             | 4            | 1            | 1         | 1             | 1       | 36901    |
Table II. Pottery from San José de los Jémez Mission complex.

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<th>Jemez B/W Bowl</th>
<th>Jemez B/W Spanish Forms</th>
<th>Jemez B/W Closed Form</th>
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### SUMMARY OF POTTERY TYPES - TABLE I

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<td>Potsuwii Incised</td>
<td>1</td>
</tr>
<tr>
<td>Puname Polychrome</td>
<td>3</td>
</tr>
<tr>
<td>Jeddito Black-on-yellow</td>
<td>2</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>36,901</strong></td>
</tr>
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</table>

### SUMMARY OF POTTERY TYPES - TABLE II

<table>
<thead>
<tr>
<th>Type</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jemez Black-on-white</td>
<td>5,851</td>
</tr>
<tr>
<td>Jemez Culinary</td>
<td>5,062</td>
</tr>
<tr>
<td>Glaze Decorated</td>
<td>346</td>
</tr>
<tr>
<td>Historic Red</td>
<td>23</td>
</tr>
<tr>
<td>Puname Polychrome</td>
<td>13</td>
</tr>
<tr>
<td>Kapo Black</td>
<td>6</td>
</tr>
<tr>
<td>Sikyatki Polychrome</td>
<td>1</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>11,302</strong></td>
</tr>
</tbody>
</table>
the still noble, though ruined church and its monastery. But there are also more subtle reminders of the Franciscan occupation here. These are fragments of Indian-made decorated and plain pottery, but of shapes then familiar in the Southwest only to Europeans. The friars either showed examples of Iberian styled ceramics to the Indians or drew pictures of forms they wanted copied. Even though European style pottery is rare at this site, there are several different categories.

Soup Plates, or Bowls

There are first the wide rimmed shallow plates commonly called "soup bowls." Three kinds were in use, those made locally of Jemez Black-on-gray, and plain historic period red "soup bowls," some imported, and others of local clay and temper. The wide rimmed shallow glaze-decorated plates were imported, probably made in the Zia area (Figs. 3 and 4). Both the pueblo rooms and monastery apartments contained examples of this style of pottery. Jemez Black-on-white shallow bowl sherds are slightly more numerous than similar forms of both historic period red and glaze-decorated wares. Almost complete and/or fragmentary examples of their Iberian-inspired form are illustrated in Figures 3 and 4.

Cups

The cup, although apparently very rare at this site, is evidenced in the form of Jemez Black-on-white handles and historic period red ware handles. Glaze-decorated cups are also known, one example being especially interesting (Fig. 5). No pitcher forms were noted, although some of the handles mentioned could possibly be parts of such containers.

Plain Redware

Plain redware rectangular and globular vessels as well as soup plates complete the inventory of Iberian-inspired domestic pottery (Fig. 6).

Ecclesiastical

Three fragmentary ecclesiastical items, all sure signs of zealous resident friars, are significant. They are manufactured of Jemez Black-on-white pottery and are an almost complete chalice, the upper portion of
Figure 4. Giusewa and San José soup plate rim designs and body profiles. Bowls of this shape and design consist of imported Glaze F (Kotyiti G/P) or local Jemez B/W copies made locally.
Figure 5. Late glaze-decorated bowl sherds, left; Glaze P cup and small bowl sherds, center and right. Specimen at lower right, with coiled exterior, is unique.
Figure 6. Historic period redware. Lower left, small bowl; lower right, rectangular bowl; top, soup bowl with unusually wide rim.

Figure 7. Jamestown B/W ecclesiastical items. a - candle holder designed to contain three candles; b-c - fragmentary chalice, top, stem, and part of base.
a sconce designed to hold three candles (Fig. 7 A-C), and a fragment of a small cross, not shown.

The presence of glaze-decorated pottery at this site not only gives a clue as to the probable span of occupation, but also suggests one of the most constant sources of contact the inhabitants had with Indians outside the immediate area.

Imported Pottery

Glaze-decorated ware, though scantily represented, occurred in both pueblo and monastery room fill. Glazes A, B, and C are indications of a pre-Spanish occupation during ca. A.D. 1315 to A.D. 1450. But the more dominant glazes of both monastery and pueblo rooms date from about A.D. 1515 to ca. A.D. 1650. These fall within the Glaze E-F (V-VI) group. Pecos Glaze V (ca. A.D. 1625) occurs, as well as an overall glaze sherd ("probably from the Cochiti area," Warren, 1968). Showing the greatest impact, however, was Glaze F (Kotyiti G/P), an import which provided cups, soup plates, and large bowls. It was the Glaze F bowl rim that local potters liked to copy when manufacturing Jemez Black-on-white bowls.

Warren studied 136 glaze-decorated sherds, types A-F, from both sections of LA 679, and from a portion of her study I quote, "although 14 different temper types were noted, nearly 70% of the sherds contained Zia basalt. None of the sherds were found to contain the crystal pumice that is typical of the Jemez Black-on-white ware . . . The Zia basalt suggests a pueblo in that vicinity as a source of the Glaze vessels" (Warren to Lambert, 1968).

Historic Period Redware

Redware is represented by only 12 pueblo room sherds, plus 23 monastery complex fragments of similar type. The paucity came as some surprise because Salinas Redware occurred in appreciable amounts in such mission ruins as Quarai and Abó (Toulouse, 1949, pp. 14-16; Ely, 1935, photos front and back cover). A similar redware is commonly associated with Spanish contact sites of the Middle and Northern Rio Grande regions,
where it is found with majolica and other Iberian pottery, as well as with late glaze-decorated ware and additional indigenous pottery types. Twenty-one of the total 35 examples from Giusewa and San José Mission were examined by H. Warren, who found that "8 contained Zia basalt (diabase) temper. The rest contained the pumiceous lithic vitrophyre used in the plain culinary wares of LA 679" (Warren, 1968).

Since redware, a pottery designed in a variety of shapes for domestic use, became fairly general throughout many parts of Hispanic and Pueblo Indian New Mexico, its scarcity at San José de los Jemez again probably demonstrates the Jemez people's resistance to Franciscan influence, plus a refusal to accept sudden change.

In addition to plain red and glaze-decorated pottery, other imported ware consisted of 48 sherds of the following types.

Puname Polychrome, represented by 16 fragments and one restored bowl (Fig. 8), is an ancestral Zia matte painted ware that arrived at this site in the 17th century. Room 116 of the pueblo yielded three sherds while monastery rooms, and "Monastery General" contained the remaining 13. Puname Polychrome became extremely popular in the Zia, Santa Ana, and San Felipe areas south of the Jemez region in Spanish contact times and also found its way into many historic Southwestern sites.

Kapo Black is a handsome burnished ware occurring abundantly in historic sites north of Santa Fe, especially in the vicinity of San Ildefonso, Santa Clara, San Juan, and the Pojoaque-Nambe area. Twenty-two are Kapo Black sherds, 16 of which are from the pueblo fill and the remaining six from the monastery rooms. Pueblo room 108 produced fourteen of the Kapo Black sherds, presumably from the same vessel, since all contained the same tempering material used in Jemez Black-on-white. Other fragments of this ware appear to be imports from the Tewa Pueblo area of northern New Mexico.

Other Imports

Additional Northern Rio Grande areas are represented by seven potsherds, all imports from the Chama Valley or Pajarito Plateau. They are
Figure 8. Puname Polychrome bowl, an import from the Zia area, from University of New Mexico - Museum of New Mexico excavation.
from pueblo rooms. Five are prehistoric and are approximately of the same age as the early glazes (A-C). These consist of one Abiquiu Black-on-gray and four Bandelier Black-on-gray (Biscuit A-B) sherds.

A Sankawi Black-on-cream fragment and one Potsuwi'i Incised sherd are contemporaneous with Glazes E-F, historic redware, and Kapo Black pottery at Giusewa.

The Hopi area, far to the west in northern Arizona, also left a record of contact with inhabitants of this pueblo. Two pueblo rooms contained one Jeddito Black-on-yellow sherd. A Sikyatki Polychrome sherd is recorded as from "Monastery General."

It is impossible to say whether or not Hopi pottery arrived here by direct or indirect means. Both Jemez and Hopi people appear to have known each other in the prehistoric period and on into the 17th century. Showing strong resistance to the Spaniards from the outset, a group of Jemez Indians fled westward in 1696, first to Acoma and then to Zuni, where Hopi contacts were made. Jemez influence among the Hopi can best be noted by the importance placed on the Jemez katchina, in whose honor an entire ceremony is performed.

Pecos Glaze Polychrome (V). If the Pecos Indians and Giusewa inhabitants were in contact in the forepart of the 17th century, Pecos Glaze V was not among any regular imports, for only three fragments were identified. The two pueblos were undoubtedly friendly, however, specially toward the end of the century, when the Indians of New Mexico joined forces to oust the Spaniards in the 1680 Pueblo Indian Rebellion.

A long-standing friendship between Pecos and Jemez is also demonstrated by the fact that Walatowa (present day Jemez Pueblo) is the place where the Pecos survivors were invited to settle when their pueblo was abandoned in 1838. Pecos descendants are a strongly integrated part of Jemez today.

Kiva I (Table III) was excavated by the 1936-37 field crew. Its pottery is typical of that which was contained in both the pueblo and monastery rooms. The kiva also appears to have been used as a refuse
Table III. Pottery, Kiva I, Giusewa Pueblo.

**DECORATED WARE**

<table>
<thead>
<tr>
<th>Jemez Black-on-white</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bowl</td>
<td>1241</td>
</tr>
<tr>
<td>Soup Plates</td>
<td>6</td>
</tr>
<tr>
<td>Closed Forms</td>
<td>626</td>
</tr>
<tr>
<td>Cup</td>
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**Glaze Decorated Ware**

<table>
<thead>
<tr>
<th>Bowl</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>Bowl Body Pieces</th>
<th>Cup F</th>
<th>Olla</th>
<th>Late or E</th>
<th>F</th>
<th>Olla Body Pieces</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>26 (inc. 1 Pecos V)</td>
<td>49 (1 &quot;M&quot;)</td>
<td>14</td>
<td>2</td>
<td>3</td>
<td>31</td>
<td>132</td>
</tr>
</tbody>
</table>

**Historic Plain Red**

| Historic Plain Red | 3 |

**TOTAL DECORATED WARE**

| Total Decorated Ware | 2011 |

**CULINARY WARE**

<table>
<thead>
<tr>
<th>Coarse Plain or Striated</th>
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</thead>
<tbody>
<tr>
<td>Slightly Smoothed</td>
<td>139</td>
</tr>
<tr>
<td>Smooth Scraped</td>
<td>19</td>
</tr>
<tr>
<td>Ribbed</td>
<td>11</td>
</tr>
<tr>
<td>Incised Plain</td>
<td>1</td>
</tr>
</tbody>
</table>

**TOTAL CULINARY WARE**

| Total Culinary Ware | 1981 |

**TOTAL WARES**

| Total Wares | 3992 |
depository, or was perhaps purposely filled. Most of the pottery is of locally produced Jemez Black-on-white and Jemez utility ware. The only fragments suggesting Spanish influence, or contact, are two Glaze F cup sherds and three pieces of historic redware.

**San Luis Blue-on-cream.** Other than the major architectural features: the great church and its accompanying monastery, the single San Luis Blue-on-cream sherd (room 116), the little gypsum serpent head (Fig. 9), and the fired adobe brick, are the only direct evidence of Franciscan occupation at LA 679 of which I can report.

Because of the lack of field notes and artifactual materials other than indigenous pottery, this paper has made no pretense of being an in depth study. But the classification of some 52,192 sherds has indicated a few interesting facts. Seventeenth century Giusewa people were using and/or making vast quantities of Jemez Black-on-white and Jemez culinary ware. The Jemez Black-on-white pottery of this pueblo, as well as Jemez Black-on-white throughout the region, show little change from that which was being manufactured three centuries earlier. This can only mean that Jemez potters were strongly provincial and that they chose to keep old traditional colors, forms, and designs. The only exceptions, though very rare, were the borrowing of a few cup, plate, and perhaps pitcher forms. Potters also made an attempt to copy rims of imported Glaze F bowls. Infrequently the rim designs of (Kotyiti) Glaze F bowls were also poorly reproduced. Giusewatowa, "pueblo of the hot place," ought to have been as well known prehistorically as Jemez Springs is today. Shortly after their arrival in New Mexico, Spanish explorers learned of the medicinal qualities of the hot springs, from which the pueblo derived its name. Yet even in pre-Spanish times there appears to have been little contact or trade with other Indians.

The abundance of local wares, and the paucity of imported Indian pottery and Iberian ceramics, is further proof that the resident Giusewatowans, and neighboring Jemez Indians who were rounded up and brought here for missionary purposes, combined forces to resist any and all changes, be they of a
material or religious nature.

The study I made (1979) of the San José de los Jémez Church and its frescoes and the classification of the LA 679 pottery herein discussed strongly point toward the need of much more research at this important site, as well as many others in the Jemez region. An example is an excavation conducted at Amoxuimqua many years ago by the late F. W. Hodge. At this large site, also dating into the 17th century, Venetian glass beads and metal artifacts were uncovered (Reiter, 1938, Vol. I, p. 86, fn. 18). Research here, at Astialaquia, and perhaps Patoqua, might solve some of the mystery surrounding San José de los Jémez, as well as give fresh information regarding late 16th-early 17th century Spanish contacts in the Jemez Mountain pueblos.

Santa Fe, New Mexico

Figure 9. Serpent's head, front and profile views, perhaps part of a base design of a religious statue, recovered from terrace of San José de los Jémez church.
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HORSES AND HORSEMEN IN EARLY NATIVE AMERICAN ART

DAVID M. BRUGGE

A single motif, the horse, became important in the art of many Indian tribes in protohistoric times, paralleling its growing importance in the cultures of the various tribes. This importance was greatest on the Plains and among some of the Southwestern tribes that maintained their independence through Spanish Colonial times and beyond. A complex that involved use of the horse in transportation, hunting, gambling, and warfare, and as a symbol of wealth and prestige, spread widely among peoples of diverse linguistic stocks. The free tribes in closest contact with the Spaniards at the beginnings of written history in New Mexico were the Athabaskan-speaking Apacheans, while the Shoshonean-speaking Utes were not long in establishing contact as well. The horse complex was rapidly diffused to tribes who had little or no contact with the colonists and distinctively Indian equestrian traditions evolved from the original Spanish complex.

Little if any Indian art pertaining to the earliest phases of the acceptance of the horse has survived. An occasional Pueblo petroglyph of horse and rider may be attributable to the 16th or 17th centuries, such as one example from the Galisteo Basin illustrated by Schaafsma (1972, p. 200, fig. 172). The earliest depictions of similar subject matter in Navajo country are very much like those in the Pueblo area and are probably the work of Pueblo refugees during the very late 17th century or early 18th century.

A distinctly Navajo style appears sometime in the early to mid-18th century (James and Davidson, 1976; Brugge, 1976). While it incorporates traits that appear in the Puebloan style, it shows a sharp break with the general feeling of Puebloan horses. Part of this may be attributed to the methods used in producing the art. Early Puebloan horses all appear
to be pecked petroglyphs. The Navajo style includes some pecked figures, but more were done by incising and there are pictographs as well, the latter often in multiple colors. It has been suggested that the new style reflected at least in part an earlier Apachean tradition of hide painting (Brugge, 1977, pp. 144-145). No exceptionally early examples of Apachean painting on either buckskin or buffalo hide are known to have survived, however. Conditions in New Mexico, a poor, sparsely populated colony exposed to almost continuous warfare with neighboring tribes, were not conducive to the preservation of such specimens as may have been acquired, and none has yet been located in collections in Mexico or Europe where survival might be expected.

That the Navajo stylistic tradition did not exist in isolation is evident in scattered reports from more distant locales. Incised horse petroglyphs in Ellsworth County in central Kansas show a number of similarities to the Navajo tradition (Wedel, 1959, pp. 484-487). This is in an area occupied by the historic Wichita whose neighbors on the west were Plains Apaches (Ibid., p. 587). Other horse petroglyphs with strong stylistic resemblances are reported from Dinosaur National Monument in northeastern Utah in what may have been Ute country at the beginning of the historic period (Castleton, 1978, pp. 43-44). In each case the resemblances are greatest to Navajo styles tentatively dated to the 18th century. Specific traits for the Kansas petroglyphs include legs that are single lines in the lower portion and double lines in the upper, legs separated from body by lower line of body, pinnate tails, upraised mane, upward slanting neck, body partially filled in with hatching, rider with triangular body, round head, reins, and quirts. In Utah, points of similarity include single line for lower leg and double line for upper, legs separated from body by lower line of body, hatched body, elongation, possible upraised mane, and riders with triangular and hourglass bodies.

The wide distribution of such figures, yet their rarity in the literature, suggests that the stylistic traits were spread by art in some other, less durable, form. Hide painting is perhaps the most likely such
medium. Being portable and of relatively high value, painted hides might not only accompany their owners on journeys, but could be frequently traded. A painted buffalo robe in the Musée de L'Homme in Paris provides interesting support for such a suggestion. Unfortunately the history of the specimen can be traced back only to its coming into white ownership. The date of the painting, the name of the artist, and the tribe of origin are unknown. It was presented in 1837 to a dancer in Washington, D. C. by a young Sioux warrior, Moukaushka (Viola, 1976, pp. 106-107). The painting on the robe is an elaborate and detailed battle scene in which 16 horses appear, of which 13 bear riders. In addition, there are over 40 unmounted human figures, a few of which are intended to represent riders who had dismounted for the battle.

While a Sioux origin would seem to be implied, the most that can be assumed is a northern origin by 1837. The painting has definite stylistic ties with hide paintings variously attributed to such northern tribes as Gros Ventres, Sioux, Assiniboin, Hidatsa, and Blackfoot. The Gros Ventres are considered the most likely source for these other specimens (Feder, 1980, pp. 55-62). All are thought to date to the 1830s, but exhibit stronger Euroamerican influences than the Moukaushka robe, particularly in depictions of horses. This may be indicative of an earlier date of origin for the robe, work by a more conservative artist, or production in an environment more remote from white influences. In any case, it is representative of a less developed style.

While Euroamerican artistic influences are not entirely lacking in the Moukaushka robe painting, they are minimal. In the horses, the number of traits shared with Navajo styles of the 18th and early 19th centuries are far more significant to the inquiry considered here. In some traits these similarities are greater with Navajo petroglyphic art than with Navajo pictographs. As most known Navajo pictographic horses appear to date from the 19th century or very shortly prior to that century, the influences probably derive from an earlier time. Perhaps the closest
among Navajo pictographs is the complex scene in upper Canyon del Muerto near the Blue Bull Panel. This is Grant's Site CDM-263 (Grant, 1978, pp. 260-261). Although Grant suggests a mid-19th century date, I would place it close to 1800 and would not object to a late 18th century date. The northern Plains styles obviously had developmental histories of their own, but they seem to have received at least some of the conventions used in representing the horse along with the animal itself as its use spread northward from the Spanish colony in New Mexico.

In much early Native American art the use of space and perspective were viewed by the artists in a somewhat different manner than that to which we are accustomed in the realistic art of Euroamerican traditions. It is a matter of uncertainty to what degree the conventions of this early Indian art were purposeful characterizations, to what degree symbolic, and to what degree they were the result of limitations of the artistic traditions of which they were a part. I am inclined to think that all three factors played a role. Just as a Christian artist could paint a halo that he had never seen around the head of an otherwise completely objectively realistic figure, so an Indian artist could include in an obviously secular scene conventions representative of religious concepts that to us would seem out of place and do so with what were completely rational motives when considered within his own world view. On the other hand, some technically difficult means of representing three dimensional space on a two dimensional surface have been successfully mastered by only a few cultures, generally those more complex cultures that we sometimes distinguish by the term "civilization."

One convention that appears commonly in Indian art of this period is a rotation of point of view for different parts of the same composition or even of the same figure. This is most familiar perhaps in representations of the human figure which often have a somewhat Egyptian look due to portrayal of shoulders and torso in full front view even when a side view is clearly indicated by other features. Although horses are drawn in a vertical lateral plane, their feet are, when differentiated at all, shown
in the horizontal plane, emphasizing the track characteristic of the animal rather than the hoof itself. In Navajo art this is depicted as a circle at the end of each leg, appearing like a bulbous foot. Use of a realistic side view of the hoof does not appear in Navajo art until well into the 19th century. The convention most commonly used on the Moukaushka robe is an arc suggestive of a horseshoe shape, especially for the front feet, while an expanded or bulbous foot is sometimes used for the rear feet. The horseshoe shape was common in other Plains works (Feder, 1980), but is not known from Southwestern art. The importance of the animal's track is clear in both areas, even if we cannot be certain what symbolic import it carried. A common origin of the convention is implied, however.

Similarly, the use of a single narrow line to represent the lower portion of each leg and two lines or a solid acute triangle to represent the musculature of the upper leg in both areas seems to stem from a single source. The departure from realism is not in this case so great as to rule out independent solutions to the same problem were this not a part of a larger complex. In Navajo rock art it is more developed in petroglyphs than in pictographs, some of the earliest pictographs showing attempts to render more fully realistic legs.

The front and rear legs of Navajo horses usually converge to indicate motion, more so in petroglyphs than in pictographs. The northern painting shows this trait to about the same degree that it appears in Navajo pictographs.

One of the more striking conventions is that of depicting the legs as separated from the body by the lower line framing the torso. This is characteristic of Navajo drawing of horses in rock art from a very early date until close to the end of the 19th century. Again it is most common in petroglyphs, particularly those that are incised, but does appear in some of the earlier painted horses. In Navajo rock art the lower line of the body is sometimes straight even when the rest of the creature is shown in a curvilinear style. This is also true of some of the horses on the Moukaushka robe, but not of all. Both traditions permitted portrayal of
the penis to identify the sex of individual horses, but it appears with some frequency in the Plains paintings while it is rare in Navajo rock art.

Another very distinctive trait of both traditions is the use of pinnate or feather-like tails. Again among the Navajos this usage is known primarily from petroglyphs, although it appears at CDM-263 in painted form. On the Moukaushka robe all horses appear to have had pinnate tails originally, but some seem to have been painted over in an effort to redo them in a later, more realistic style.

The earliest depictions of horses' bodies in Navajo rock art are rectangular or trapezoidal, but a more curvilinear style soon evolved. The torsos of the Moukaushka horses are generally curvilinear and realistic and lack the tendency toward elongation that is frequently seen in early Navajo examples. In both traditions the neck is invariably slanted upward, but again the Navajo necks show a tendency for elongation that is lacking in the northern specimen. Both straight and curved necks appear in each set.

Manes are usually depicted on early Navajo horses by upright lines, suggestive of cropped manes but often of exaggerated length. Early painted horses also sometimes have drooping manes drawn with evenly spaced lines similar to those used for cropped manes. Similar conventions appear on the buffalo robe. In addition, however, some of the horses on the robe have bushy or even flowing manes done in more solid colors.

The horses' facial features are sparsely represented if at all in both early traditions. Eyes and nostrils are entirely lacking. On the robe, mouths are shown opened, but are not indicated on Navajo horses. Both ears are depicted upright in both series. The horn-like ears of some early Navajo rock art panels are lacking on the robe.

In Navajo multicolor pictographs and on the robe there is an apparent effort to show individualized markings and characteristics of each horse. While this attention to the identity of specific animals is absent in the simpler Navajo panels, especially the petroglyphs, it is sufficiently marked in the more elaborate compositions that it provides another unifying aspect.
to the two traditions.

Riders naturally conform in most respects to human figures not shown on horseback. In most Navajo rock art, the lower part of the body is simply not shown, but some pictographs show one foot below the horse's belly and a few also indicate legs or capes over the side of the body, but only one leg is shown. On the robe, both legs are usually depicted, done in a darker color than the body of the individual and crossing the horse's body as though both were on the same side, an impression obviously not intended. Bent knees and feet indicate directional movement in the same manner as for men on foot. Torsos are geometric in both traditions. Navajo bodies are usually triangular, rectangular or hourglass-shaped, and usually in full front view. The northern torsos are trapezoidal and all are full front.

Arms are usually extended outward in each direction with upper arms slanting downward and with bent elbows so that forearms slant upward, much like the conventional Navajo sandpainting figures of Holy People. In Navajo examples and on the robe there is an occasional figure with one arm crossing the chest so that both arms may be shown functioning in front of a figure facing to one side, front being indicated as noted above by directionality of legs as well as by the direction in which the mount faces. Hands may or may not be indicated. The effect is much like that of early Egyptian painting, although no historical connection exists here with Old World usages. Heads are usually full circles on top of rectangular necks, full front views but lacking facial features, in both Navajo rock art and on the robe.

Dress is limited in both series. Capes, serapes, or robes cover some bodies, usually those of white soldiers, in the Navajo examples, and hats also seem to be used generally to distinguish whites. All figures on the robe are Indian, precluding any comparison of these traits. While a rare Navajo example may wear necklaces, usually if any clothing at all is shown on an Indian rider it is a headdress of some sort. The same is true with regard to the figures on the buffalo robe, although it is difficult
to determine which figures sport headdresses and which have hair worn in elaborate fashion.

Weapons show the usual range in both series, but with significant differences. Navajo riders, if armed, are usually shown with bows, arrows, and lances. Quivers are omitted. Unless carried by white soldiers, guns and swords are seldom shown except in very late panels, probably all post-dating 1850. The Indian riders on the robe not only have bows, arrows, and quivers, but a substantial number of guns and swords. Lances do not appear, but there are numerous objects that probably represent coup sticks, war axes, and elbow pipes. Appropriately, most figures with bows wear quivers and most with guns wear powder horns. Interest in the weapons and paraphernalia associated with war far exceeds that in known Navajo rock art.

One of the most interesting differences is in the positions in which shields are depicted. Navajo shield carriers on horseback almost always have the shields between the viewer and their own bodies. A few late examples carry the shields low over the horses' bodies. On the robe, the shields are consistently held to one side so as not to obstruct the view of the riders, often above and in front of the right arm. The Navajo convention for horsemen with shields is undoubtedly an outgrowth of similar representations of warriors on foot that in prehistoric times were widespread, from the Southwest (Schaafsma, 1972, pp. 102, 146) and northward through the west as far as southern Canada (Grant, 1967, p. 63). Figures holding a shield to one side also occur in Southwestern art, both in Navajo 18th century pictographs and in Pueblo mural painting (Smith, 1952, plate A). The difference appears to be in the artist's way of viewing a shield, either as a part of the figure or as a separate object, since overlapping two figures to create perspective is rare in both rock art and hide painting. It does appear to a limited degree in kiva murals, however.

Of particular interest in horse figures is the range of horse gear commonly shown. The early Navajo rock art places emphasis on quirts, reins,
and the chin plates of the Spanish Colonial style bit. These same features are those depicted on mounted horses on the Moukaushka robe. Saddles are extremely rare in the earlier Navajo petroglyphs, but are shown on both mounted and unmounted horses at CDM263. It is noteworthy that saddles appear on the northern specimen only on horses without riders. Saddle blankets are explicitly shown in the CDM263 panel, but otherwise are rare in Navajo rock art until very late. They are absent in the hide painting.

A most interesting comparison is that of subject matter. On the Plains, scenes of warfare seem to be especially popular. The Moukaushka robe is only one of a large number of such scenes known from over a wide area. In Navajo rock art, while riders may depict the warrior role or invading soldiers, actual battle scenes are rare and probably late as well. Armed Indian riders may be plausibly interpreted either as hunters or warriors in many older panels. The earliest actual battle scene is probably that attributed to the 1850s at CDM-6, the Ute Raid Panel.

Two elements of overall composition show similarities. The first is the map-like use of the surface on which work was done, giving the impression of the ground as seen from above while the figures are seen in side view. This is emphasized in some compositions, particularly from the Plains, by the use of tracks or footprints to indicate the course of movement of various figures.

The second feature is in the relative size of the figures. In Plains hide painting, most figures are to about the same scale and are usually of nearly identical sizes for each species shown. On the Moukaushka robe, the only human figures of significantly smaller size are two probably intended to represent children as they are shown riding double on horses with women. In Navajo rock art, the use of size appears to be symbolic of the roles of individual figures in the action depicted. In complex panels, large and small horses and riders are distributed almost randomly with regard to space, but the larger figures seem to be those most prominent in the event. In simple panels with few figures all are about the same size or at about the same scale. Examples of the first instance are
common in hunting scenes where the deer is as large as the horse of the hunter. The Blue Bull Panel is a good illustration of the latter, the bull and cow being large, but the calf between them being small.

The number of shared traits for horses in early Navajo rock art and in early Plains hide paintings suggests a common origin. It has been suggested above that this source was Apachean hide painting of a somewhat earlier era. Two traits of the many included in the complex may be suggested as old Athabaskan as they seem to lack Pueblo counterparts and do not depend on the horse for expression. These are the pinnate tails and the use of the lower line of the body to separate the legs from the torso. Legs shown by only a single line are omitted from the following list since this convention is very widespread.

Distribution of the pinnate tail is as follows:

- Chaco Canyon, New Mexico, horses, pre-1800 (Brugge, 1976)
- Chinle area, Arizona, Navajo, horses, pre-1800 (James & Davidson, 1976)
- Galisteo, New Mexico, Tano, skunks, pre-1793 (Schaafsma, 1972, p. 149)
- Central Kansas, Wichita(?), horse, undated (Wedel, 1959, p. 487)
- Northern Plains, Gros Ventre(?), horses, pre-1837 (Viola, 1976, p. 107)
- Milk River, Alberta, Gros Ventre or Blackfoot, horses, undated (Grant, 1967, pp. 36, 131)
- Churchill River, Saskatchewan, Cree or Athabaskan, bison, undated (Grant, 1967, pp. 147-149)

The remaining trait, legs separated from the body by a line, has a known distribution that does not differ greatly:

- Chaco Canyon, New Mexico, Navajo, horses, pre-1800 (Brugge, 1976)
- Chinle area, Arizona, Navajo, horses, pre-1800 (James & Davidson, 1976)
- Central Kansas, Wichita(?), horses, undated (Wedel, 1959, pp. 484, 487)
- Northeast Utah, Ute(?), horse, undated (Castleton, 1978, p. 44)
Northern Plains, Gros Ventre(?), horses, pre-1837 (Viola, 1976, p. 107)
Southern Wyoming, bison, undated (Grant, 1967, pp. 10-11)
Northeast Nebraska, Winnebago(?), "medicine animal," post-1863(?), (Grant, 1967, pp. 34-35, 133)
Milk River, Alberta, moose(?), date? (Wormington and Forbis, p. 127)

While a few of the recorded examples outside the Southwest are specifically assignable to Athabaskans, the distributions are close enough to those postulated for Athabaskans in protohistoric times that diffusion from an Athabaskan source or mis-attribution due to poor dating are ready explanations. A number of the examples share other traits with the general complex considered here, but they are so widespread that, while distinctive as a part of the complex, they lack value in any attempt to trace their individual origins.

The problem of tracing the histories and interrelationships of tribal styles included in this complex is not as easy of solution as it would appear on cursory consideration. If the original style is an Athabaskan style of hide painting brought south by the proto-Apacheans, it might be expected to have much the same distribution as the derivative styles that spread and developed with the northward expansion of the horse complex in later times. Thus the early examples should be older in the more northern locations while the later examples would be younger when found farther to the north. It may be presumed that the later distribution could be separated out when the subject matter concerns horses, but that when other animal forms are depicted the date must be derived from an independent line of evidence. It is even quite possible that later stylistic developments on the Plains, such as the emphasis on battle scenes, diffused back by a similar route to Athabaskan artists, accounting for the few panels of this sort found in Navajo rock art.

The original style from which the complex grew may have differed so greatly from the later styles that only very detailed comparisons of well dated examples will permit confident tracing of the history of diffusion of the complex and evolution of the tribal styles. Successful
resolution of the problem may shed light on the dating and route of Athabaskan migration into the Southwest. This is a question that remains critical both to the description of culture history and to the understanding of important theoretical questions that depend on assumptions based on this route and the time of arrival of Athabaskans in the Southwest. If the original Athabaskan style was rare in rock art, however, as the examples thus far reported seem to indicate, the job of tracing connections may be quite difficult, but sufficient data exist to hold some promise as a new approach to the problem.

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FOUR EXCEPTIONAL MEN

THE FOUNDATIONS OF NORTHERN RIO GRANDE ARCHAEOLOGY

DOUGLAS W. SCHWARTZ

INTRODUCTION

The first sixty years of professional development in northern Rio Grande archaeology were dominated by four exceptional men: Adolph Bandelier, Edgar Lee Hewett, Nels C. Nelson, and Alfred V. Kidder. Though each had contemporaries working in the region, it was almost exclusively these four who laid the early intellectual foundations for the study of northern Rio Grande prehistory. Chronologically, their contributions read almost like a classic study in the history of science; but the uniqueness of this case is that four such powerful, creative, and energetic individuals could have worked in so small an area during such a short period of time. In few regions of the world has the beginnings of the discipline been so fortunate in its founders, nor have the personal stories behind their conceptual contributions been more interesting. This paper examines the parts played by the lives and ideas of these four men in the growth of northern Rio Grande archaeology.

ADOLPH F. BANDELIER

Adolph Bandelier laid the foundation for modern scholarship in the archaeology and ethnology of the northern Rio Grande region, an accomplishment all the more remarkable because his career in the Southwest did not begin until he was forty years of age. Though Bandelier was an active part-time library scholar in his early adult years, he was required to spend most of his time working in his father's businesses in a small southern Illinois town. In the 1870s, he met and came under the intellectual influence of Lewis Henry Morgan, a leader of American Archaeology and a strong advocate of cultural evolution. This relationship invigorated Bandelier's scholar-
ship, and in rapid order he wrote several papers and three larger reports on the culture of ancient Mexico. Eventually, however, the frustrations and overwork of his business career, coupled with a heavy self-imposed schedule of writing, led to a physical collapse.

Bandelier saw this breakdown as a turning point in his life and following a plea for help, Morgan suggested Bandelier undertake a study in the Southwest of the Pueblo Indians and their ruined villages. Morgan also convinced the Archaeological Institute of America to support this research. In August of 1880, Bandelier arrived in New Mexico, and shortly thereafter wrote of the region's research potential.

New Mexico has superior advantages...for archaeological and ethnological study. It is the only region on the whole continent where the highest type of culture attained by its aborigines—the village community in stone or adobe buildings—has been preserved on the respective territories of the tribes. These tribes have shrunk, the purity of their stock has been affected, their customs and beliefs encroached upon by civilization. Still enough is left to make of New Mexico the objective point of serious, practical archaeologists; for, besides the living pueblo Indians, besides the numerous ruins of their past, the very history of the changes they have undergone is partly in existence... (Bandelier, 1881:28-29).

Bandelier's description makes the region sound like an ideal base for research, yet two points in the quotation need comment to place it in larger perspective. First, it must be remembered that while Bandelier was to become an important contributor to the scholarship of the region, he nevertheless had to continue selling the Archaeological Institute of America on the value of his work. For from the beginning, the Board was divided on providing funds for his support and on the value of work in the Americas as opposed to research in the Classical Mediterranean area (Lange and Riley, 1966, p. 16). Hence the glowing terms used to describe his
research universe probably reflected both his enthusiasm and served as a subtle public relations effort on behalf of the importance of his work. In fact, his real love may always have been the high culture areas of Mexico and Peru which he earlier had referred to as "that far more important journey."

Second, the influence of cultural evolution is clear in Bandelier's reference to "the highest type of culture." However, while Bandelier was beholden to Morgan and sympathetic to his views, from the beginning of their relationship he demonstrated an independence of thought (White, 1980, p. 109). Bandelier's private journals show clearly that he held a theoretical position close to Morgan's, but his published writings tend to be more descriptive, less dogmatic, and cognizant of the influence of other factors, such as the environment, on cultural development (Lange and Riley, 1966, p. 36).

Bandelier visited, observed, and studied for varying lengths of time in the pueblos of Pecos, Santo Domingo, and Cochiti. Also in the Jemez Mountains area, he explored the Frijoles Canyon archaeological complex. Always he wrote extensive descriptions and interpretations in his journals. And by 1892, when he left the Southwest to begin a ten-year study in the South American Andes, Bandelier had published *The Delight Makers*, the first novel about Pueblo Indians, searched archives for historical material, studied Spanish maps and journals, examined archaeological sites, spent months in the pueblos for ethnological study, and left a mountain of scholarly material for future researchers.

Bandelier's greatest archaeological contributions were the first descriptions of a large number of sites in the northern Rio Grande, yet early in his writing he began trying to make sense of his observations, drawing for insights on his ethnographic and historical work. First, in his effort to impose order on the data, he separated the sites into chronological categories, initially only historic and prehistoric (Bandelier, 1881, p. 104). Later he recognized that not all of the prehistoric sites were simultaneously occupied and tried to date them through their associated
painted and plain pottery, which he recognized as having a rough chronological
significance (Bandelier, 1883, p. 29).

He postulated a sequence of architectural change from "the many-storied
communal houses" and "the one-story buildings of stone" and concluded that
"small-house dwellers . . . became extinct before the conquest" (Ibid., pp.
30-31). His reason for the postulated settlement changes was that "the
pueblo Indians of New Mexico, especially the Zuni, assert their ancestors
first lived in small houses in scattered villages, and that only when
enemies began to threaten them did they resort to building communal houses
for the purposes of defence \(\text{sic}\)" (1884, p. 78). Implicit in this and all of
Bandelier's reconstructions is the assumption of community between the
past and the present. He believed that the Indians he met along the
Rio Grande were descendents of the people who left the archaeological
remains. The point was worth making since at the time so many writers
attributed prehistoric American ruins to the Welsh, Egyptians, Phoenicians,
and the lost tribes of Israel, so the concept of continuity with the past
and the ability of the American Indians to create were not to be assumed.

Adolph Bandelier saw that his work was only beginning. After all his
descriptions and speculations were behind him, he wrote in the last para-
graph of his final report, written in Santa Fe in 1891:

the time has not yet come when positive conclusions in regard
to the ancient history of the Southwest can be formulated. In
the course of the past ten years, new methods of research have
been developed in ethnology, as well as in archaeology, and at
some future day these may lead to the solution of questions which
at present are perhaps not even clearly defined (Bandelier, 1892,
p. 591).

It was on the base provided by Bandelier that northern Rio Grande
archaeology could begin to grow.
Four years after Bandelier left the Southwest, Edgar Lee Hewett, a young classics teacher from Colorado Normal School at Greeley, began exploring the archaeological remains on the high mesas sloping east from the Jemez Mountains, an area he later named the Pajarito Plateau. This introduction to the anthropology of the northern Southwest completely changed the course of Hewett's professional life, directing him first toward archaeological research and later to the development of the first institution for anthropological research and education in the northern Rio Grande area. Hewett's career, however, was to be characterized by great energy and intelligence directed to a series of activities, but each to be superseded by the next as a new interest arose, so while he made many contributions, at the end of his life he was perhaps better known for their quantity rather than their quality.

Hewett's growing reputation for archaeological expertise and his previous experience in educational administration brought him an invitation to become the first president of New Mexico Normal School at Las Vegas, now New Mexico Highlands University. He held this position between 1898 and 1903, during which time he continued to be active in field archaeology. Soon Hewett realized that he wanted a full career in archaeology and needed further academic training. In the fall of 1903, he traveled to Switzerland to begin work on a doctoral degree at the University of Geneva. After completing his class work, Hewett returned to the United States and became involved in several projects that appealed to his great interest in the preservation of archaeological ruins. These projects included the creation of Mesa Verde National Park and, with Congressman J. F. Lacey, the development and passage of the 1906 Antiquities Act.

In 1906, Hewett became a fellow of the Archaeological Institute of America, the same organization that had supported Bandelier, and was granted funds to extend his archaeological surveys into Mexico and Central America. The following year, the Institute decided to establish a center for archaeological studies in the Americas, with Hewett as its director and
Santa Fe as its location. The institution was originally named the School of American Archaeology, but Hewett’s vision of its potential was reflected in a later name change to School of American Research.

In 1908, Hewett took a leave of absence to complete the final examinations for his doctoral degree at Geneva, and that year he also published his dissertation, *Les Communautés Anciennes dans le Desert Americain*. Returning to Santa Fe, he threw himself into the development of the new School. Most of the next 39 years, Hewett spent as an administrator, builder, promoter of civic works, and educator. All of these roles he accomplished with energy and dedication, creating a number of organizations supporting education and research, and providing inspiration to Indian craftsmen, students, scholars, and an expanding public interest in anthropology, a public he helped create.

Though Hewett originally left education to pursue a career in Southwestern archaeology, his exclusive concentration on that field was short-lived. Within two years of receiving his doctoral degree, his major interests had shifted first to Central American archaeology, and then out of active field research completely.

So, although Hewett over the next few decades was to do a great deal to contribute indirectly to the growth of Southwestern archaeology, his own substantive contributions were limited to only a few years. The specifics of these will be dealt with in the remainder of this section. Through eleven works, published between 1904 and 1909, Hewett took northern Rio Grande archaeology far beyond the work of Adolph Bandelier.

It is understandable that Hewett’s first archaeological interest, as represented by his published work, should be the preservation of the prehistoric resources he saw first during his Jemez Mountains survey and later during his trips throughout the Southwest (Hewett, 1902; 1903; 1904; 1905). Yet while preservation remained a lifelong interest, this phase of his work climaxed early, and by 1906 he had largely moved on to four other major activities. His other major archaeological interests in the northern Rio Grande were the documentation of the sites he was discovering during the
surveys and excavations, the ordering of data first regionally and then temporally, and finally, and perhaps always his first love, the interpretation and consideration of the processes that conditioned changes in prehistoric cultures through time. Hewett's ideas on each of these topics is reviewed briefly below.

After eight years of survey in the Jemez Mountains, Hewett's first descriptive article appeared and clearly demonstrated the high-quality work of which he was capable. Reporting the results of his systematic survey on the Pajarito Plateau, he divided the area into subregions, established a site-type classification, and described the major sites in detail. He provided quite comprehensive architectural information, good site plans, and comments on form, location, building sequence, and comparisons with other sites outside the region. However, no mention was made of associated artifacts. The importance of this early paper was that it provided the first comprehensive description of archaeological sites in the northern Rio Grande. For its time and even with its limitations, the report was a respectable model for future publications. It was followed two years later by Hewett's first monograph, *Antiquities of the Jemez Plateau, New Mexico* (1906) which covered the same material that had appeared in his first article, but in much greater detail. Again, the description focus was architecture, and little attention was given to artifacts.

These early reports show Hewett's great potential as a field archaeologist whose well structured plans of research led to solid descriptive contributions. With Hewett as its leader, the growth of northern Rio Grande archaeology in the early 1900s seemed assured. But this promise was not to be realized. Hewett published only three more papers that might be considered contributions to the data base of northern Rio Grande archaeology (1908; 1909a; 1909b), each the result of his move to excavation, first at the pueblo of Puye on the Pajarito Plateau, then to Frijoles Canyon. This first account was a generally popular article in a magazine called *Out West* (Hewett, 1908, pp. 1-29) where he described the general nature of Puye Pueblo with "a detailed description of the great community house . . . reserved
until the excavations of the present season (1909) shall have doubled the area uncovered and afforded more complete data for the description" (1908, p. 29). This is an important paper historically since it was the first report of an excavation in the northern Rio Grande, but the more complete description of the excavations that were promised never appeared.

The following year, two additional excavation reports appeared as articles in the American Anthropologist, producing summary results of the excavations at four sites in Frijoles Canyon: Tyuonyi, "Sun House," Snake Village, and the Large Cave Kiva, but still written in a generally popular form and again promising more details later which were never to appear.

Hewett's second interest focused on the temporal ordering of the prehistoric sites he was discovering. While his ideas were stimulated and largely based on his work in the Jemez area, his approach was intended to apply to the whole prehistoric Pueblo world. Hewett concluded "that there is evolutionary and chronological sequence to be seen in the construction and occupancy of the domiciliary structures of Pajarito Park" (1904b, p. 657). He divided this sequence into three epochs based on his "analysis of Pueblo history" and founded on "sociologic development" (1904a, p. 437). While specific material culture and elements of social organization were presented as characterizing each epoch, his main organizing feature was type of habitation. First, The Pretraditionary Epoch - "an obscure, archaic epoch of semisedentary occupation" based upon scant evidence from rock-shelters and natural caves that sheltered a population "in the most primitive stages of culture . . . on the American continent" (Hewett, 1904a, p. 438). Next, the long Epoch of Diffusion was one in which "small communities were distributed over the semi-desert areas; devoted to agriculture; under matronymic social organization; dwelling in fairly substantial houses" with "strictly utilitarian" pottery. This epoch of "clan making" was "characterized by the absence of predatory enemies" (Ibid., p. 438). Finally, the Epoch of Concentration, the most recent period, began with "the concentration of clans of defensive purposes into the great communal houses, made expedient by the arrival of the nomadic, predatory tribes." This was the time
characterized by "the formation of the present Pueblo languages, . . .
the elaboration of the great ritualistic ceremonies," and "the highest
development of the ceramic art" (Ibid., pp. 437-438).

Interestingly enough, even with this quite creative perception of
temporal organization, time was never again to be an important part of
Hewett's conceptual framework. In fact, as noted in the following section,
twenty-five years later in his evaluation of Nelson's work, Hewett could
not really understand why temporal divisions were considered so important.

Hewett's third interest on geographic ordering of the prehistoric
data surfaced first in a 1904 report to the Department of the Interior when
he presented a map of known Southwestern sites grouped into the four
major river drainages--Rio Grande, San Juan, Little Colorado, and Gila, with
sub-regions for each. His objective was to "show at a glance that the
distribution of the prehistoric tribes of the Southwest was determined by
the drainage system." Each of these districts, referred to at one point
as culture areas, Hewett considered part of "the pueblo region" (Hewett,
1904, p. 4). The following year, he expanded on this idea (Hewett, 1905)
in an important report which also served as his first general presentation
on the archaeology of the Southwest, and added that materials from the
Mimbres valley and from the area north of the Colorado River might be
distinctive enough to require some special consideration. The culmination
of Hewett's concern for the geographic ordering of Southwestern archaeo-
logical material came in his published doctoral dissertation in 1908.
Essentially this was a polished reworking of his earlier papers, but it
did add the region of Chihuahua to his classification. With this
presentation he had preceded Kidder's 1924 areal ordering of Southwestern
archaeology by nearly two decades. However, as in the case of his insights
into temporal ordering, except for his much later and extremely general
book on the Southwest (1930), Hewett left to others the task of pursuing
further the implications of his work on the culture areas of the prehistoric
Southwest.

The last main archaeological interest of Hewett was in interpretation.
Throughout his other papers were three ideas which characterize his major
concerns in this area and speak to the state of the art during the first
decade of the 20th century when he was most actively concerned with northern
Rio Grande archaeology: cultural evolution, the role of climate change, and
the discontinuity in Pueblo population. While in his earliest articles
Hewett paid some lip-service to the then current orientation toward cultural
evolution, from the beginning his was tempered by an awareness of the
importance local factors had in modifying the direction of culture growth.
For example, following his exposition on the epochs of Pueblo culture, he
wrote, "How far this evolutionary order will hold for other regions depends
upon geological, climatic, and other environmental influences" (Hewett,
1904b, p. 658). However, he felt strongly that climate was a key to under­
standing the hundreds of depopulated archaeological ruins scattered
throughout the Southwest, and their abandonment he saw as "principally a
question of subsistence" (Ibid., p. 659), resulting from "climatic
modifications by reason of which the hardships of living at these sites
became unendurable" (Hewett, 1906, p. 13), a modification characterized by
"a slow, progressive drying up of this region" (Hewett, 1909a, p. 22).
Finally, while others like Bandelier were seeing a continuity in Pueblo
population, Hewett felt strongly the Pueblo tribes were related to the
occupants of the prehistoric sites only in a "qualified" way (Hewett,
1906, p. 12). He saw non-conformities in symbolism and physical type, and
adding to this clues from this analysis of Tewa mythology, he could not
accept the conclusion of continuity. "That there was relationship is not
questioned, but the degree of relationship is yet to be determined"
(Hewett, 1909b, p. 340). Yet Hewett was never satisfactorily able to
identify this relationship.

Edgar Lee Hewett by any objective standard must be considered a
major figure in the early development of northern Rio Grande archaeology.
His contributions to the field, though made over a relatively few years,
began where Bandelier left off and moved the archaeology of the area to a
stage of active organized research. But Hewett was a man of many talents
and enthusiasm, and his interest in Southwestern field archaeology, which
had shown such great potential, soon reached the limit. Hewett cannot be
said to be a failure in archaeology just because he did not continue in it. It can only be said that after spending less than a decade actively
pursuing archaeological field work, he moved on to be a success in several other fields over the next three decades, not the least of which was to provide opportunities to a great many young archaeologists who were successfully to succeed him in northern Rio Grande archaeology.

NELS C. NELSON

Just as Hewett was abandoning his concentration on northern Rio Grande field archaeology to pursue his other interests, Nels C. Nelson entered the region. Although he was to work in the Southwest for less than four years, he greatly influenced the future of archaeology in the area and helped create a revolution in American archaeology (Willey and Sabloff, 1974, p. 94). Nels Nelson, educated at the Universities of Chicago and California-Berkeley, was a young archaeologist at the American Museum of Natural History in New York when he was sent to the Southwest in the summer of 1912 as part of their extensive field research program. He initiated systematic examination of seven pueblo ruins in the Galisteo region south of Santa Fe, directing the excavation of approximately 448 rooms, plus kivas and trenches through trash mounds (Nelson, 1914, p. 7). His meticulous notes were far beyond those of Hewett's and consistent with Nelson's goal, since he saw this project as "an opportunity to prosecute a piece of research work in the most scientific manner" (Ibid., p. 9).

Nelson had identified a series of pottery types, and his primary concern was the chronological sequence in which these occurred. After analyzing his 1912 data, he returned to the field in 1914 to continue his herculean excavation efforts, feeling "reasonably certain . . . what was the chronological order of the four apparent pottery types," though "tangible proof" he was searching for in the form of stratigraphic support for their temporal differences "was still wanting" (Nelson, 1916, p. 162). That year he excavated at Paa-ko, northeast of Albuquerque, at San Marcos, at Cieneguilla, at the upper and lower Arroyo Hondo sites in the Santa Fe drainage, in the
Cochiti drainage, and at San Cristobal in the Galisteo Basin. At San Cristobal, Nelson dug ten-foot-deep trash deposits in arbitrary layers and then classified and recorded the sherds by levels. Using this stratigraphic method, he could see how the character of the sherd collection changed as the depth of the trash mound increased. As a result, he proposed a succession of pottery development from black-on-white ware, through glaze-on-gray, white, yellow, or red, into the later glaze polychromes (Ibid., pp. 162-164). That winter his work was excitedly described by Wissler in the *American Museum Journal*, "It can now be told at what relative date each of these (ruins) was built" (Wissler, 1917, p. 100).

Nelson's seminal work made clear the importance of the stratigraphic method and the use of pottery types as chronological tools. His results prepared the way for a northern Rio Grande regional chronology by making it possible to date surface collections from other sites. In fact, this breakthrough provided Southwestern archaeology as a whole with a new field method and a basis for constructing a series of hypotheses on cultural succession. Nelson's own interpretative conclusions that there had been a continuity of population in the region, sided with Bandelier over Hewett.

It is nearly impossible to reconstruct the personal dynamics of archaeology in these early days, but we can obtain glimpses of it from two reactions to Nelson's work. Even though in his own time his results were seen as critically important, fifteen years after their publication Hewett was still not able to agree with most of the profession on their significance. Evaluating Nelson's work, Hewett wrote almost petulantly:

> It would be hard to find a student of Southwestern archaeology of the last twenty years who has not been carried away, more or less, with the study of pottery; there are those who apparently look upon culture stratification as embracing the entire science of archaeology and who regard the pottery record as the key that is to unlock the doors of antiquity. Just why chronology should be considered of such vast importance is difficult to understand (Hewett, 1930, pp. 156-157).
Another reaction to Nelson's work came from the American Museum of Natural History. Nelson's approach may have been too scientific for those who paid his salary. One undocumented hypothesis (Richard Woodbury, personal communication) suggests that Nelson left the Southwest after 1914 because his sponsors at the American Museum were so impressed by the spectacular display of quality artifacts, i.e., whole pots, being collected by Earl Morris at Aztec Ruin and other sites. They, therefore, shifted their support away from Nelson in Morris' favor. The study of Southwestern prehistory and probably the whole discipline of archaeology lost an important scholar through this decision, and it was left to others to build upon Nelson's critical insights.

ALFRED VINCENT KIDDER

In the summer of 1907, Edgar Hewett invited three Harvard undergraduates to participate in a series of archaeological projects in the Southwest. Two of these students were so influenced by the experience and so capable that they each were to make an important impact on American archaeology. One was Sylvanus Morley, the other Alfred V. Kidder. Kidder helped develop a broad professionalism in northern Rio Grande archaeology by radically upgrading the analysis of the region's prehistoric pottery, initiating an era of large-scale, organized excavation, producing a series of important descriptive works, and writing the first comprehensive synthesis of Southwestern archaeology.

Hewett, who was characterized that summer by Kidder as "one of the most learned men for his age I have ever met" (Woodbury, 1973, p. 12), gave these young students an unexcelled opportunity. First he sent them alone to survey in southwestern Colorado, after which they assisted Hewett in mapping several sites at Mesa Verde and participating in his excavations at Puye on the Pajarito Plateau. The following summer, Kidder was back in the Southwest, this time to work under Bryon Cummings in southeastern Utah.

In 1909, Kidder entered graduate school at Harvard to study anthropology and soon came under the tutelage of two scholars who greatly influenced his
intellectual development. George Chase showed Kidder the potentials of ceramic analysis as practiced on classic Greek vessels, and Egyptologist George Reisner introduced him to a much more sophisticated understanding of research design and advanced field techniques than he had been exposed to under Hewett or Cummings (Wauchope, 1965, p. 151; Woodbury, 1973, pp. 20-21). The influence of Chase and Reisner became obvious first in Kidder's doctoral dissertation and later in his work at Pecos Pueblo.

Kidder's dissertation, completed in 1914, shows the effect of his considerable field experience and the extent of his intellectual growth. The topic he chose was not a modest one: "Southwestern Ceramics: Their Value in Constructing the History of the Ancient Cliff Dwelling and Pueblo Tribes: from the Point of View of type Distinctions." Recognizing that "no adequate descriptions of the pottery" had been published, Kidder's intention was to start "remedying this condition" by providing a "short description of the known wares" based on a careful analysis of ceramic collections from a wide area of the Southwest (Kidder, 1914, pp. 411-412). More than 50 pages dealt with the pottery of the Pajarito Plateau alone, contrasting sharply with Hewett's single page on Pajaritan pottery that had appeared only a few years earlier (Hewett, 1906, p. 52).

In his dissertation, Kidder discussed the relationship between pottery and culture and speculated on the chronology of the wares from distributional and design clues. He was quick to point out, however, that his temporal conclusions were tentative because "no stratified finds have given us absolute conclusive proof." Then, in a footnote near the end of the monograph, clearly inserted after the main work had been completed, Kidder reported that Nelson had just published his San Cristobal work and commented, "it can hardly be doubted that this most important discovery will throw light upon the sequence of the types described in this paper" (Kidder, 1914, p. 461).

Thus, within a single year two students of northern Rio Grande ceramics had both recognized the importance of pottery as a tool that could contribute to placing prehistoric occupations in time and assessing cultural relationships. Nelson's approach stressed extensive excavation and the use of
stratigraphy, with relatively little emphasis on pottery description. Kidder, on the other hand, used pottery construction, design, and distribution to hypothesize temporal relationships, while recognizing that stratigraphic data were needed to validate his ideas. The two approaches meshed perfectly to provide an important new step in the development of archaeology far beyond the northern Rio Grande. These two young scholars may have worked independently. Kidder had not used sherds from the collections of the American Museum of Natural History where Nelson was employed, although in the small universe of northern Rio Grande archaeological research it is hard to imagine that Kidder would not have heard of Nelson's work.

In 1915, under the auspices of the R. S. Peabody Foundation, Kidder began his important excavations of the Pecos and Forked Lightning ruins in the upper Pecos Valley, the largest excavation of their day north of Mexico, which still stand as a major element in the fabric of American archaeology. From the beginning, Kidder envisioned the stratigraphic method as a foundation for the whole project. In addition, he believed that detailed study, not just pottery, of all the artifacts and architecture was essential to the successful completion of the research. For ten summers he worked at Pecos which led to a series of published papers and reports that established an admirable standard of work (Kidder, 1916; 1917; 1924; 1925a; 1925b; 1927; 1932; 1936; Kidder and Amsden, 1931). Kidder also intended to write a culture history of Pecos Pueblo, but because of changes in his career, the grand synthesis was never written (Woodbury, 1973). Only a short overview appeared in his last Pecos report (Kidder, 1958), written in his twilight years, long after the formative period of northern Rio Grande archaeology had passed.

First in 1922 on a part time basis, then by 1929 full time, Kidder's research and administrative talents shifted from the Southwest to focus on Central America when he became chairman of the Division of Historical Research for the Carnegie Institute of Washington. Any time he spent on his Pecos material after that was bootlegged from his Maya research and
general administrative duties. Therefore much of the final work he had envisioned for the Pecos project was short-circuited by this radical turn in his career directions (Woodbury, 1973).

In much of his writing, including his great Introduction to Southwestern Archaeology (1924), Kidder repeatedly returned to three explanatory themes: the cultural relationship between the northern Rio Grande and the rest of the Southwest; the origins of northern Rio Grande population and culture; and the sequence of the region's cultural development. Even before the introduction of dendrochronology, Kidder perceived that the cultural climaxes of the San Juan, Mesa Verde, and Chaco Canyon areas predated the appearance of large population concentrations along the Rio Grande (Kidder, 1924, p. 87). He felt that the Rio Grande area contributed little to the cultures of the west, a view he summarized when he wrote "the Rio Grande received but apparently gave nothing in return" (Kidder and Shepard, 1936, p. 596).

With regard to the origins of the northern Rio Grande population and culture, especially Pecos Pueblo, Kidder initially conceived them as having developed locally (M.A. and A.V. Kidder, 1917, p. 354). Later he allowed for a migration from the northern San Juan area but not specifically from the Mesa Verde or the Chaco regions (Kidder and Amsden, 1931, p. 152). He labored to point out the importance of the San Juan Basin as a "breeding ground" for Anasazi culture, while arguing against an actual migration from that area as an explanation for Pecos culture (Kidder and Shepard, 1936, pp. 596-610).

Kidder's ability for and interest in synthesis is most elegantly manifest in his sketch of cultural development for the northern Rio Grande area written for his Introduction to Southwestern Archaeology. After an initial "pre-Pueblo type" occupation of small settlements, which were never described in detail, Kidder saw the first Pueblo period as characterized by small houses whose residents used black-on-white and corrugated pottery not closely identified with any specific ceramic types of the San Juan or other regions. Next appeared larger Puebloan structures of at least two stories built around courtyards with kivas, with a few red wares added. Glaze pottery
was then introduced, and settlements became still larger with great quadrangles or sometimes circular ground plans, though the absolute number of sites declined. Finally, "toward the close of the glazeware period, after many of its most flourishing sites had already been abandoned, came the discovery of the Southwest by the Spaniards" (Kidder, 1924, p. 86).

This summary, while building upon the earlier work of Bandelier, Hewett, and Nelson, was nevertheless based mainly on Kidder's ability for synthesis. Given the short time that had passed since Hewett's attempts at sequential reconstruction, Kidder had clearly made significant strides in detail, chronological relationship, and cultural changes. His general conception of northern Rio Grande prehistory was not substantially improved upon for thirty years, and these improvements came only after the development of dendrochronology and the publication of substantial amounts of new data.

It is rather ironic that Kidder's work was later severely criticized by Taylor (1948) for failing to provide provenience data for artifacts, for lacking the long promised grand synthesis of Pecos Pueblo, and for demonstrating no interest in process. Kidder was deeply hurt by his attack (Schwartz, 1979, pp. 167-168), yet earlier in his career Kidder had warned his peers that unless they followed his lead in large scale excavation that "archaeology will lap into superficiality" (Kidder and Shepard, 1936, p. 628).

Kidder's work in the Southwest spanned five decades, and by the mid-1950s he had become the most important scholar in the region, carrying on brilliantly where Hewett left off, moving archaeology forward by a quantum leap in research design, published artifact descriptions, and local and regional syntheses. On the occasion of Kidder's death, Robert Greeno wrote, "Few archaeologists have had the breadth, the vision and the ability to see that vision realized to the extent that Kidder had." Perhaps a fairer appraisal would make it clear that at least for his northern Rio Grande work and especially the Pecos synthesis, Kidder was not able to achieve all he had set out to accomplish. In the tradition of Bandelier
and Hewett, he too had enthusiasms and personal concerns that took him beyond field archaeology in the Southwest.

Conclusion

The ideal scenario for the intellectual history of regional archaeological research is well illustrated by the four steps in the early development of northern Rio Grande archaeology:

| Discovery | Bandelier | 1880-1892 |
| Organized survey and initial interpretation | Hewett | 1896-1909 |
| Gaining temporal control | Nelson | 1912-1916 |
| Systematic long-term research and the beginnings of synthesis | Kidder | 1907-1929 |

The four men responsible for this sequence all came to the Southwest from the East and brought with them support from major eastern institutions. All of them initiated their work on the basis of intellectual conceptions current in the eastern establishment ranging from overarching theories like cultural evolution to techniques such as stratigraphic excavation. But each also built upon and surmounted existing concepts to the extent that their contributions brought them recognition in American anthropology far beyond the northern Rio Grande.

With the coming of the 1930s, a new era of archaeological work began in the northern Rio Grande, a period no longer dominated by single individuals. Researchers from several institutions were now simultaneously involved in field archaeology. At least one of them was self-taught, others were students of Hewett, and some were still coming from eastern institutions. They included: H.P. Mera, Marjorie Lambert, Hubert Alexander, Frank Hibben, Florence Ellis, Bertha Dutton, and Paul Reiter. As a group they were to continue to move the archaeology of the region ahead, an accomplishment made possible in part by the solid intellectual beginning resulting from 50 years of the combined work of four exceptional individuals.

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The Archaeological Society of New Mexico, the oldest of its type in the Southwest, was organized on September 14, 1900, as the Santa Fe Archaeological Society. By 1906, its interests had expanded, and it became a statewide organization.

In 1908, it cooperated with the Peabody Museum of Harvard and the Southwest Society (later Southwest Museum) in aiding the Archaeological Institute of America in its New Mexico expeditions. In November of the same year, the School of American Archaeology, an arm of the institute, accepted a tentative proposition of the society to locate in Santa Fe, provided that a need for a museum was met. On February 19, 1909, the legislature established the Museum of New Mexico. By 1913, the first publication for the society, *El Palacio*, appeared.

During the following years, the society's activities decreased until the reorganization of 1956, when the first annual meeting of all local societies convened in Santa Fe. The idea of a Bandelier Lecture was conceived at the time, and an Amateur Achievement Award was inaugurated the following year. Annual meetings since have been held throughout the state, sponsored by local societies. The lectures and awards have continued. Other programs initiated include scholarships, publication of *Papers of the Archaeological Society of New Mexico*, field schools, a statewide rock art survey, and a certification program. The society today has a number of affiliated societies, including two in Texas and one in Arizona.